Box 516, Saint Louis, Missouri 63166 (314) 232-0232

dogo

17 January 1983

Robert L. Morby, Chief Waste Management Branch Air and Waste Management Division United States Environmental Protection Agency 324 East Eleventh Street Kansas City, Missouri 64106

Reference: R. L. Morby Letter to J. C. Patterson dated 101 December 1982

Enclosure: Four (4) Copies of Figure B-3, entitled "Tract I Facility Plan"

revised 14 January 1983

REGISTERED MAIL - RETURN RECEIPT

Dear Mr. Morby:

This letter is in response to your referenced letter. In that letter, you indicated that segments of our Part "B" RCRA application were considered to be incomplete. In this letter, we will list your comments and our responses. These are as follows:

Comment: 1. The locations of the hazardous waste storage units within the facility must be specified (40 CFR 122.25 (a)(19)(x) and (xii)). Locations have not been clearly defined.

Reply: Attached you will find four (4) copies of Figure B-3, "Tract I Facility Plan", revised 14 January 1983. The revision has added site identifications per your request.

A copy of this letter is being forwarded to Missouri DNR, along with five (5) copies of the revised Figure B-3.

Comment: 2. The estimated volume of traffic (number and type of vehicles) must be submitted. (40 CFR 122.25 (a)(10))

Reply: The estimated volume of daily traffic at the specified storage areas follows on the next page.

MCDONNELL DOUGLAS

CORPORATION

Container Area No. 1 - 30 tugs/forklifts; 3 cars/trucks; 0 aircraft. Container Area No. 2 - 6 tugs/forklifts; 6 cars/trucks; 0 aircraft. *Tanks H-19 and H-20 - 10 tugs/forklifts; 1 car/truck; 0 aircraft. Tanks H-12, 13, 14, 15, 16 - 10 tugs/forklifts; 1 car/truck; 0 aircraft. Tanks H-1, 2, 3, 4, 5, 6, - 9 tugs/forklifts; 1 car/truck; 0 aircraft. *Hush House Waste Tank - 4 tugs/forklifts; 0 cars/trucks; 0 aircraft. *Fuel Pit No. 3 Waste Tank - 2 tugs/forklifts; 0 cars/trucks; 2 aircraft. *F-18 Silencer Waste Tank - 1 tug/forklift; 0 cars/trucks; 0 aircraft. *Bldg. 28 Waste Tank - 0 tugs/forklifts; 0 cars/trucks; 0 aircraft. *Bldg. 6 Waste Oil Tank - 0 tugs/forklifts; 0 cars/trucks; 0 aircraft. Bldg. 14 Sludge Holding Tank - 0 tugs/forklifts; 1 car/truck; 0 aircraft.

* Waste from these areas is recycled, and therefore is exempt from federal hazard waste regulation under RCRA.

Comment: 3. The contingency plan must include an evaluation plan or the rationale for why an evacuation plan is not necessary (40 CFR 264.52(f)).

Reply: Section G, Page G-21 references "Emergency Plan No. 4 - Building Emergency Actions and Procedures".

We believe that our "Emergency Plan" on Pages G-23 through G-28 contains the necessary information concerning an evacuation plan.

This referenced emergency plan contains a section, on Page G-28, entitled "General Emergency Evacuation Instructions".

Comment: 4. The necessary tank design information is not provided in the application. This information should include:

- a. Reference to a design standard or other information used in the design and construction of the tank;
- b. Tank dimensions, capacity, and shell thickness for all tanks;
- c. Diagrams of piping, instrumentation and process flow:
- d. Descriptions of feed systems, safety cutoffs, bypass systems, overflow control, and pressure controls.

Reply: The following is supplied for your information.

TANK DESCRIPTION	DISPOSAL METHOD	REGULATIONS APPLICABLE	CATEGORY
Two 10,000-gallon-capacity tanks designated as H-19 and H-20	Recycle	DNR	RCRA Exempt
Five 500-gallon-capacity tanks designated as H-12, H-13, H-14, H-15, H-16	T.S.D.F.	DNR and EPA	
Six 750-gallon-capacity tanks designated as H-1, H-2, H-3, H-4, H-5, H-6	T.S.D.F.	DNR and EPA	-1
One 3,000-gallon-capacity tank designated as "Hush House Waste Tank"	Recycle	DNR	RCRA Exempt
One 2,000-gallon-capacity tank designated as "Fuel Pit No. 3 Waste Tank"	Recycle	DNR	RCRA Exempt
One 2,000-gallon-capacity tank designated as "F-18 Silencer Waste Tank"	Recycle	DNR	RCRA Exempt
One 5,000-gallon-capacity tank designated as "Bldg. 28 Waste Tank"	Recycle	DNR	RCRA Exempt
One 1,000-gallon-capacity tank designated as "Bldg. 6 Waste Oil Tank"	Recycle	DNR	RCRA Exempt
One 120,000-gallon- capacity tank designated as "Bldg. 14 Sludge Holding Tank"	T.S.D.F.	DNR and EPA	

TANK DESCRIPTION	STANDARD DESIGN	DIMENSIONS	TANK DETAILS MAXIMUM CAPACITY	SHELL THICKNESS
Five 500-gallon-capacity, open-top, vertical, self-supporting flat bottom, cylindrical aboveground tanks. Designated as Tanks H-12, H-13, H-14, H-15, and H-16.	U.S. Plastic Corporation	48" dia. x 71" high	555 gallons	1/4"

DESCRIPTION OF FEED SYSTEMS, SAFETY CUTOFFS, BYPASS SYSTEMS, OVERFLOW CONTROL AND PRESSURE CONTROL

Waste solution comes from one of two process tanks. Each tank contains 540 gallons. When the solution in either of these two tanks is declared waste, the on-site pipe-fitter is notified to transfer this solution into the waste storage tanks. This transfer is accomplished with a continuous recirculating process tank pump via valving and schedule 80 CPVC piping. In the event of emergency, the valves may be closed and/or the pump stopped. These storage tanks are covered with loose-fitting (not sealed) covers.

The process tanks and the storage tanks are open to the atmosphere and operate at atmosphere pressure; therefore, no pressure controls exist. Any overflow that would occur will be contained by a six-inch high asphalt curb and diverted into our own Industrial Waste Water Pretreatment Plant. The tanks are interconnected to allow bypassing from one tank to another as they are individually filled.

TANK DESCRIPTION	STANDARD DESIGN	DIMENSIONS	TANK DETAILS MAXIMUM CAPACITY	SHELL THICKNESS
Six 750-gallon-capacity, open-top, vertical, self-supporting, flat bottom, cylindrical above-ground tanks. Designated as Tanks H-1, H-2, H-3, H-4, H-5, and H-6.	Chem-Tainer Industries, Division of County Plastics Corporation	55" dia. x 72" high	740 gallons	3/8"

DESCRIPTION OF FEED SYSTEMS, SAFETY CUTOFFS, BYPASS SYSTEMS, OVERFLOW CONTROL AND PRESSURE CONTROL

Waste solution comes from one 4,000-gallon process tank. When the solution in this tank is declared waste, the on-site pipe-fitter is notified to transfer this solution into the waste storage tanks. This transfer is accomplished with a continuous recirculating process tank pump via valving and schedule 80 CPVC piping. In the event of emergency, the valves may be closed and/or the pump stopped. These storage tanks are covered with loose-fitting (not sealed) covers.

The process tank and the storage tanks are open to the atmosphere and operate at atmosphere pressure; therefore, no pressure control exists. Any overflow that would occur will be contained by a six-inch high asphalt curb and diverted into our own Industrial Waste Water Pretreatment Plant. The tanks are interconnected to allow bypassing from one tank to another as they are individually filled.

TANK DESCRIPTION	TANDARD DESIGN	DIMENSIONS	TANK DETAILS MAXIMUM CAPACITY	SHELL THICKNESS
One 120,000-gallon-capacity, in-ground, open-top tank. Designated as "Bldg. 14 Sludge Holding Tank".	Originally designed as sewage sludge digestor in January, 1941, by "Russel and Axon" Consulting Engineers. Modified for Industrial Waste Sludge Holding Tank by McDonnel	level.	121,555 gal.	Walls are 12 inches minimum thickness reinforced concrete. Bottom is 6 inches thick reinforced concrete.

Aircraft Company during 1968.

DESCRIPTION OF FEED SYSTEMS, SAFETY CUTOFFS, BYPASS SYSTEMS, OVERFLOW CONTROL AND PRESSURE CONTROL

Sludge collects in settling tanks and is moved by hydraulic pressure to a manually operated pump. The Waste Water Pretreatment Plant operator controls this pump. Ridged piping conducts the settled sludge from the pump to the sludge holding tank. In the event of an emergency, valves may be closed and/or the pump stopped. The holding tank is open to the atmosphere and operates at atmospheric pressure; therefore, no pressure control exists. Any overflow that would occur will be discharged into the influent line of our Pretreatment Plant and thus be collected in the settling tanks (a closed loop system). The overflow outlet is located two feet below the top of the sludge holding tank.

Comment: 5. Technical information such as design information, adequacy of design and/or design specification should be certified by a registered professional engineer.

Reply: We have enclosed a copy of the Missouri DNR Form SCI. This form contains the requested "Engineer's Certification".

Comment: 6. The references for corrosion and erosion information should be provided or the design life of the tank should be given and certified by an engineer.

Reply:

As explained previously in this letter, because of the RCRA recycling exemption, the only tanks of concern to U.S. EPA are 1) Tanks H-1, H-2, H-3, H-4, H-5, H-6 (six 750-gallon polyethylene); 2) Tanks H-12, H-13, H-14, H-15, and H-16 (five 500-gallon polyethylene). These tanks are used to contain a mixture of nitric and hydrofluoric acids; and 3) Building 14 Sludge Holding Tank.

In reference to the suitability of using polyethylene containers for holding mixtures of nitric and hydrofluoric acids, we cite the following:

Code of Federal Regulations Title 49 Subchapter C - Hazardous Materials Regulation Part 173.299

"173.299 Etching acid liquid, n.o.s. (a) Etching acid liquid shall be a mixture of nitric acid, hydrofluoric acid, having nitric acid in concentrations of not more than 60 percent by weight, hydrofluoric acid in concentrations of not less than 4 percent by weight and water not less than 24 percent by weight, and may contain acetic acid. These mixtures must be packed in specification containers as follows:

(1) Specification 12A (178.210 of this subchapter). Fiberboard boxes with Specification 2E (178.24a of this subchapter) inside polyethylene bottles have a minimum wall thickness of 0.030 inch and screw-cap closures. Net weight per bottle may not be over 10 pounds each. The net weight per package may not be more than 40 pounds.

(2) Specification 6D or 37M (non-reusable)(178.102, 178.134 of this subchapter). Cylindrical steel overpack with inside specification 2S or 2SL (178.35 or 178.35a of this subchapter) polyethylene container not over 55 gallons capacity. Specification 37M overpack of over 30 gallon capacity must be constructed of at least 20 gauge steel throughout."

In reference to the suitability of using reinforced concrete for holding sludge with the pH range of 7.0 to 8.0, we attest to the fact that we began holding this type of sludge in this tank in 1969. Since

then, at approximately five-year intervals, we have emptied this tank. When the tank was empty, it was inspected, and no observable change from its 1969 condition was detected.

We hope that this information is sufficient to meet your needs. If you have any questions, please contact us.

Sincerely,

MCDONNELL AIRCRAFT COMPANY

J. C. Patterson, Section Manager Environmental Pollution Control

Dept. 191C, Bldg. 102, L-3

JCP:bem

EC: J. D. Doyle, Missouri DNR

STORAGE FACILITY

Did the department conduct a preliminary site investigation? / Yes /x/ He

2. Any application for a hazardous waste storage facility must include the following information:

		As Required By
В.	General Rules Applicable to all Facilities Storage in Containers and/or Storage in Tanks	10 CSR 25 7.011 10 CSR 25 7.050(3) 10 CSR 25 7.050(4)

3. List the type(s) of storage to be utilized at the facility.

Above G	round Tanks	Cont	ainers	Undergr	ound Tanks
ilumber	Capacity	Number	Capacity	Number	Capacity
13	27,000 gal.	- 1	1,705 gal.	5	13,000 gal.
* 1	120,000 gal.	1	35,915 gal.	_	
		ा	30,300 gal.	_	<u> </u>
		_ =	submar signs	-	

t In ground

Engineer's Certification

This is to certify that this application has been prepared to comply with the Missour Missouri Hazardous Waste Management Law and all applicable standards, rules, and regulations for hazardous waste storage facilities, specifically 10 CSR 25 7.050. It is my understanding that this facility has been designed to provide adequate protection of the health of humans, and other living organisms.

Registered Professional Engineer Submitting Plans

Name	Earl M. Mye	rs				Phone (3	14) 232-23
Name of C	Consulting Firm Pl	ant Engineering	Design Depart	ment			
Address _	P.O. Box 516						
City	St.Louis		(1.0)	State	МО	Zip Code	63166
Signature	Earl m	myen	Registratio	on No.	E-804	Z/ Date	1-14-8,
5.		Applicant's Ce	rtification				
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I certify under benalty of law that I have bersonally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Operator Signature

Date 17 JAN. 1983

DEC 01 1982

Mr. J. C. Patterson Section Manager Environmental Pollution Control McDonnell Douglas Corporation Department 191C, Building 102 Bex 516 St. Leuis, Missouri 653166

Duar Mr. Patterson:

The U.S. Environmental Protection Agency (EPA), Region VII Office has conducted a completeness review of the McDonnell Douglas Corporation—St. Louis Tract I Resource Conservation and Recovery Act (RCRA) storage permit application, received by this office October 7, 1982. A completeness review is conducted to determine if all the necessary items in a permit application have been addressed. A technical review of the application will follow. Items addressed in this letter are listed due to the incompleteness of that segment of the application. Items not listed may be considered complete. You should not assume those portions of the application considered complete to be totally acceptable at this time, since a technical evaluation of those items has not been conducted.

Segments of your application considered to be incomplete are as follows:

- 1. The locations of the hazardous waste storage units within the facility must be specified (40 CFR 122.25 (a)(19)(x) and (xii)). Locations have not been clearly defined.
- 2. The estimated volume of traffic (number and type of vehicles) must be submitted. (40 CFR 122.25(a)(10))
- 3. The contingency plan must include an evacuation plan or the rationale for why an evacuation plan is not necessary (40 CFR 264.52(f)).
- 4. The necessary tank design information is not provided in the application. This information should include:
 - a. Reference to a design standard or other information used in the design and construction of the tank:
 - b. Tank dimensions, capacity, and shell thickness for all tanks;

- c. Diagrams of piping, instrumentation and process flow;
- d. Descriptions of feed systems, safety cutoffs, bypass systems, overtlow control, and pressure controls.
- 5. Technical information such as design information, adequacy of design and/or design specification should be certified by a registered professional engineer.
- 6. The references for corrosion and erosion information should be provided or the design life for tank should be given and certified by an engineer.

With respect to financial requirements, we have reviewed your submittal for compliance with the appropriate Federal regulations and find that your tinancial test mechanism and supporting documentation dated July 6, 1982, satisfies the regulatory requirements of §264.143-151 for the St. Louis, Missouri facility.

We note that your fiscal year ends December 31, 1982, and wish to remind you of Subpart 264.143(f)(5) which states that an owner/operator must send updated intormation to the Regional Administrator within 90 days after the close of each succeeding fiscal year. This information must consist of all three items specified in paragraph 143(e)(3).

The Hazardous Waste Liability Insurance Certificate submitted by Central National Insurance Company of Omaha effective August 1, 1982, for sudden accidental insurance provides an additional \$2 million per occurrence and annual aggregate in addition to the financial test liability insurance annual aggregate which satisfies the requirements in 40 CFR, Part 264.147(a).

We recommend that you jointly respond to these comments and those from the Missouri Department of Natural Resources. Please submit the requested information by January 10, 1983.

If you have any questions or wish to discuss the items listed above, please contact Stephen P. Busch of my staff at (816) 374-6531.

Sincerely yours,

Robert L. Morby Chief, Waste Management Branch Air and Waste Management Division

cc: John Doyle, MDNR

bcc: Michael Sanderson, AWCM

RCRA PERMIT APPLICATION EXISTING STORAGE FACILITY

MDC ST. LOUIS

EPA ID No. MOD000818963



OCTOBER 6,1982

DATE: REVISION NO.:

CLAIM OF PROPRIETARY INFORMATION

The McDonnell Douglas Corporation's St. Louis facility is engaged in the production of products vital to the nation's defense. Additionally, the facility has been honored by visits from the President of the United States, members of Congress, the Defense Department, the armed services, heads of foreign governments, and other dignitaries. These activities all receive national attention which could place the facility in the position of becoming a target for political activists, assassins, saboteurs, pacifists, and other radical groups. In order to minimize the possibility of surrepetitious entry and/or access to classified information, devices, equipment, etc., certain plot plans included with this application are classified as PROPRIETARY INFORMATION.

As to those sections herein that are claimed to be proprietary, McDonnell Douglas Corporation proprietary rights are included in the information disclosed herein. Recipient, by accepting the proprietary portions of this document, agrees that neither these portions nor the information disclosed therein, nor any part thereof, shall be reproduced or transferred to other documents or used or disclosed to others for manufacturing or for any other purpose except as specifically authorized in writing by McDonnell Douglas Corporation.

Harold D. Altis

Executive Vice President

MCDONNELL AIRCRAFT COMPANY

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F	F-1	MDC-St. Louis Fire Services Pre-Fire Plan (6 pages)	Follows Page F-12
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K		No attachments included	

SECTION A

A. PART A APPLICATION

The Part A application for the McDonnell Douglas Corporation—St. Louis, Missouri Tract I Storage Facility was submitted to EPA Region VII on 17 November 1980. Several revisions followed the original submission.

Subsequently, the corporation was issued EPA I.D. Number MOD000818963.

To facilitate review by the Permit Application Reviewer/Permit Writer, a copy of the application "as-filed" and the subsequent revisions are provided in this section.

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Continued from the front.

III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). For each process entered here include design capacity.

Line No.	Process Code	Process Design Capacity Amount	Unit of <u>Measure</u>
11	S02	2000	G
12	S02	4380	G

T37	DROGI			TTATA	DDATIG	TAT A COMMO
IV.	DESCI	KIPIIUN	I UP	HALA	KUUUS	WASTES

- A. EPA HAZARDOUS WASTE NUMBER Enter the four-digit number from 40 CFR, Subpert D for each listed hazardous waste you will handle, If you handle hazardous wester which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.
- B. ESTIMATED ANNUAL QUANTITY For each listed wests entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste/s/ that will be handled: which possess that characteristic or contaminant.
- C. UNIT OF MEASURE For each quantity entered in column 8 enter the unit of measure code. Units of measure which must be used and the appropriate tes are:

ENGLISH UNIT OF MEASURE CO	<u>DE</u>	METRIC UNIT OF MEASURE	CODE
POUNDS		KILOGRAMS	. K
TONS	r	METRIC TONS	. M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waster For each listed hazardous waste entered in column A select the code/s/ from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous westes: For each characteristic or toxic contaminant entered in column A, select the code/s/ from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes, if more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

- 1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual
- quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

 In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
- 3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste,

EXAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds: per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill,

1.1	A	. E	PA	<u> </u>		C.	UN														D. PROCESSES
LINE NO.	HA WA: (ent	ST	ΕN	10	B. ESTIMATED ANNUAL QUANTITY OF WASTE	S (UR ente	E ?r				1.	PR			S C er)	00	ES			2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X ·	K	0	5	4	900		P		Т	0	3	L) (3 (0		T				
X-2	D.	0	0	2	400		P		Т	0	3	L) (3 (0	T	1		T	Т	
X-3	D	0	0	1	100		P		T	0	3	L) 7	3 (0		1		1	ı	
X-4	D	0	0	2						T	T		ı	T		ı	1		T	1	included with above

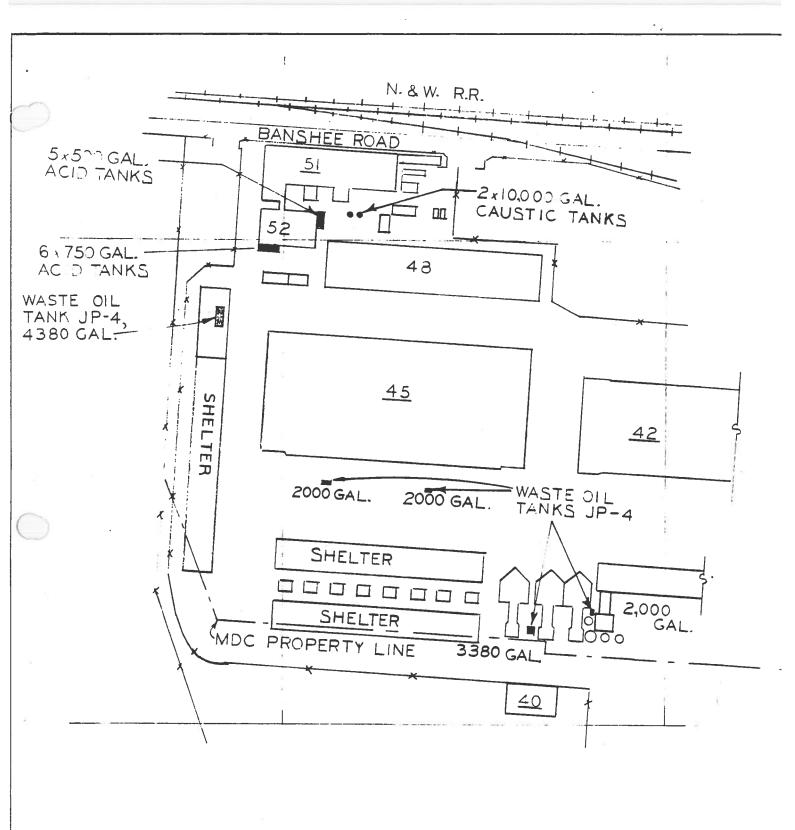
Continued from page 2. NOTE: Photocopy this page before completing if you have more than 26 wastes to list. Form Approved OMB No. 158-S80004 FOR OFFICIAL USE ONLY EFA LD: NUMBER (enter from page 1) W DUP DUP Mil 8 IV. DESCRIPTION OF HAZARDOUS WASTES (continued) A. EPA: HAZARD. WASTENG: (enter code) C. UNIT OF MEA-SURE (enter code) D. PROCESSES B: ESTIMATED ANNUAL QUANTITY OF WASTE 1. PROCESS CODES (enter) 2. PROCESS DESCRIPTION: (if a code is not entered in D(1)). 29 27 2 3 4 D 0 0 7 T 0 5 10 0 6 8 9 10 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

On advanced from the force	•	
Continued from the front.		
IV. DESCRIPTION OF HAZARDOUS WASTES (con	tinued).	
E. USE THIS SPACE TO LIST ADDITIONAL PROC	ESS CODES FROM ITEM D(1) ON PAG	iE 3.
	ii ii	
*		
•0		
EPA I.D. NO. (enter from page I)		
Fm00000818963 6		
13 14 15		
V. FACILITY DRAWING		
All existing facilities must include in the space provided on p	page 5 a scale drawing of the facility (see instruc	tions for more detail).
VI. PHOTOGRAPHS		
xisting facilities must include photographs (aeris treatment and disposal areas; and sites of future store		
VII. FACILITY GEOGRAPHIC LOCATION	age, treatment or disposar areas (see matri	ictions for more detaily.
LATITUDE (degrees, minutes, & seconds)	LONGI	TUDE (degrees, minutes, & seconds)
	301101	
65 65 67 65 - 71		72 - 74 78 76 77 - 79
VIII, FACILITY OWNER		78 - 74 78 76 77 - 79
A. If the facility owner is also the facility operator as li	isted in Section VIII on Form 1 "General Infor	mation" place an "X" in the box to the left and
	in control vill on to all t, control into	ingion , place at 70 in the box to the left are
skip to Section IX below.		
- 13	stard in Castion VIII on Earn 1 complete the	following igage:
B. If the facility owner is not the facility operator as li	sted in Section VIII on Form 1, complete the 1	
B. If the facility owner is not the facility operator as li	sted in Section VIII on Form 1, complete the 1	following items: 2. PHONE NO. (area code & n
B. If the facility owner is not the facility operator as in		
B. If the facility owner is not the facility operator as li		2. PHONE NO. (area code & n
B. If the facility owner is not the facility operator as in 1. NAME OF FACIL $\frac{c}{E}$ 15 15 3. STREET OR P.O. BOX	LITY'S LEGAL OWNER 4. CITY OR TOWN	2. PHONE NO. (area code & n
B. If the facility owner is not the facility operator as in 1. NAME OF FACIL $\frac{c}{E}$ 15 15 3. STREET OR P.O. BOX	ity's legal owner	2. PHONE NO. (area code & n
B. If the facility owner is not the facility operator as line. 1. NAME OF FACIL E 13. 15. 3. STREET OR P.O. BOX F	4. CITY OR TOWN	2. PHONE NO. (area code & n
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B. If the facility owner is not the facility operator as line. 1. NAME OF FACIL E 13. III 3. STREET OR P.O. BOX C F 13. III IX. OWNER CERTIFICATION I certify under penalty of law that I have personally of la	4. CITY OR TOWN C G 41 111 115 examined and am familiar with the inform	2. PHONE NO. (area code & n 19 26 - 38 89 - 61 62 - 5. ST. 6. ZIP CODE 40 A1 42 47 - 31
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PAGE 4 OF 5

EPA Form 3510-3 (6-80)

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REVISION	C.L.C.	9/9/83		
SCALE	l"= 200	<i>'</i>	HAZARDOUS WASTES STORAGE AREA	P.O. Box 518 Spint Louis, Missouri 82186
/N	D.L.H.	11/14/80	MDC BLDG. 45	MCDONNELL DOUGLAS
APPROVED	Ic Catter	JUNIVSE	SITE PLAN	COMPORATI
APPROVED -		11-14-11)	APPROVED FOR CONSTRUCTION	PLANT ENGINEERING
F. O.R.	F. O.		DATE	SKPE 1280 SHT

MAC 1327 (REV 23 JUL 715)

Box 516, Saint Louis, Missouri 63166 (314) 232-0232

17 November 1980

U. S. Environmental Protection Agency Region VII P.O. Box 15606 Kansas City, MO 64106

Attention: Mr. Dennis Degner

REGISTERED MAIL - RETURN RECEIPT

Dear Mr. Degner:

Enclosed you will find completed EPA Forms 3510-1 and 3510-3

If you have any questions, please contact us.

Sincerely yours,

MCDONNELL AIRCRAFT COMPANY

Jerome Patterson, Supervisor Environmental Pollution Control Department 1910 - Building 107

JCP:gs

Enclosure: EPA Forms 3510-1 and 3510-3

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II. POLLUTANT CHARACTERISTICS	r				a forms to the EPA. If you and	ver "v	/es" 1	to any
INSTRUCTIONS: Complete A through J to determine we questions, you must submit this form and the supplement	hethe	r you	u need to	submit any permit application narenthesis following the gu	estion. It'ark "X" in the box in t	he th	ird e	olumi
cuestions, you must submit this form and the supplement	101	1111 113	1100 111 1111	d mot submit any of the	ese forms. You may answer "no"	" if yo	s ruc	stivity
if the supplemental form is attached. If you answer "no" is excluded from permit requirements; see Section C of the	instru	uctio	ns. See als	o, Section D of the instruction	ns for definitions of bold—laced	term:		R O
SPECIFIC QUESTIONS		AAR	FORM	•	QUESTIONS	YES		ATTA
	YES	40	ATTACHED	N Dose or will this facility	(either existing or proposed)			
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.?		Х		include a consentrated	enimal frading operation or ion fathery which results in a		X	
(FORM 2A)	15	17	10	discharge to vioters of th	6 U.S.? (FORM 28)	110	20	1
C. Is this a facility which currently results in discharges	1	Х		D. Is this a proposed facility	ty lower than those described havill result in a discharge to		X	
to waters of the U.S. other than those described in A or B above? (FCRM 2C)	22	<u>^</u>	74	waters of the U.S.? (FC!	RM 2D)	25	26	
E. Does or will this facility treat, store, or dispose of				1 municipal effluent belo	ect at this facility industrial or withe lowermost stratum con-			
hazardous wastes? (FORM 3)	X	1	Х	enining within one of	drinking water? (FORM 4)	31	X	₩,
To you or will you reject at this facility any produced	21	27	30		et at this facility fluids for spe-		-	
Figures or other fluids which are brought to the surface	ì			alal menegeror ruy bigs t	mining of sulfur by the flasen.			
in connection with conventional oil or natural gas pro-		X		process, solution minin	ng of minerals, in situ combus- ecovery of geothermal energy?		X	
oil or natural gas, or inject fluids for storage of liquid	34	3:	131	(FORM 4)		37	31	#
hydrocarbons? (FORM 4) 1. Is this facility a proposed stationary source which is		-	1	AIOT one of the 28 in	ised stationary source which is dustrial categories listed in the			
one of the 28 industrial categories listed in the in- structions and which will potentially emit 100 tons	1	,,,		inequesion: and which	will potentially emit 250 tons utant regulated under the Clean		x	
per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an	1	X		Air Act and may affect	t or be located in an attainment		1	4_
attainment area? (FOSM 5)	10	4.	42	erna? (FORM 5)			1.4	
III, NAME OF FACILITY	بعثلب	-	-	the lateral designation of the lateral designati	the state of the s	7	and the same	
1 SKIP MCDONNELL DOUGLAS CORP ST	. L(UIS	TRA	CT I		-		·-
IV. FACILITY CONTACT			<u> </u>		The second secon			-
A. NAME & TITLE (last, f	irst, d	e title	2) .		B. PHONE (area code & no.)	4		
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2 PATTERSON JEROME SUPERVISOR				10 20		٦.,		
V. FACILITY MAILING ADDRESS							سيم	
A. STREET OR P.O	. 607	<u> </u>	7 7 7					
3 P.O. BOX 516 DEPT. 191C								
B. CITY OR TOWN				C.STATE D. ZIP C	ODE			
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4 ST. LOUIS				MO 5 3 1	0 0 1	•		
VI. FACILITY LOCATION					The state of the s	ده در احدا		
A. STREET, HOUTE NO. OR OTHER	SPE	CIFIC	IDENTI	FIER	•			
ROWN RD. AT LINDBERGH TRACT I	•				•			
B. COUNTY NAME	1	П	111					
ST. LOUIS		۸۸		7,3				
C. CITY OR TOWN				O.STATE E. ZIP C	ODE F. COUNTY COUL			
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MCDONNELL AIRCRAFT COMPANY					- 66
		210101-1		D. PHONE	(area code & no.)
C. STATUS OF OPERATOR (Linter the appropriate le	tter into the answe	r box; if "Other	specify.)	c]	111111
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E. STREET OR P.O. BO	×		-		
P.O. BOX 516			55	IX. INDIAN LAND	A SECTION OF THE PROPERTY OF T
F. CITY OR TOWN		G.STATE	H. ZIP CODE	Is the facility locate	ed on Indian lands?
	t. t. 1 + 1 +	' ' , ' ,	62166	YES	NO NO
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and the same of the same to th	area extending	to at least one m	ile beyond pro	perty boundaries.	The map must show
Attach to this application a topographic map of the the outline of the facility, the location of each of	its existing and	proposed intake	and discharge	structures, each o	tits hazardous waste
*********** etorara or disposal tabilities, and eacil	AASH AAMELE IF III	CECS HOIGE CHICA	rground. Inclu	ide all springs, rive	its and other source
water bodies in the map area. See instructions for p	recise requireme	nts.			-
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XIII. CERTIFICATION (see instructions)	A CONTRACTOR OF STREET				يحجه ووقدو لستجمعه مصواصية حصد
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I certify under penalty of law that I have personal attachments and that, based on my inquiry of	aliy examined an	g am samuai wii amediately respo	nsible for obt	aining the inform	ation contained in th
attachments and that, based on my inquiry of arctication, I believe that the information is trut	crose persons in accurate and o	omplete. I ani a	ware that ther	e are significant p	enalties for submittin
information, including the possibility of fine	and imprisonme	nt.		• _	
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FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "TO!"). FOR EACH PROCESS ENTERED HERE ROCLSSES (continued) ELUDE DESIGN CAPACITY.

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DESCRIPTION OF TRAZARDOUS WAS LES ... PROPERTY OF THE FOUR HOLD FOR THE FOR THE FOUR HOLD FOUR HOLD FOR THE FOUR HOLD FOR THE FOUR HOLD FOR THE FOUR HOLD FOUR HOLD FOR THE FOUR HOLD FOR THE FOUR HOLD FOR THE FOUR HOLD FOUR HOLD FOR THE FOUR HOLD FOUR H handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristical formula of the characteristic ucs and/or the toxic contaminants of those hazardous wastes.

ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste/s/ that will be handled which possess that characteristic or contaminant.

UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes.are:



·	METRIC UNIT OF MEASURE CODE
ENGLISH UNIT OF MEASURE CODE	KILOGRAMSK
POUNDSP	METRIC TONS
TONST	METRIC TORS

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

PROCESSES

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III 1. PROCESS CODES:

to indicate how the waste will be stored, treated, and/or disposed of at the facility. For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code/s/ from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

DTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by are than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual

quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter

"included with above" and make no other entries on that line, 3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

XAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) — A facility will treat and dispose of an estimated 900 pounds ar year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes e corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 29 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

23 honuas ber Aew	of that waste. Treatment will be	C. UNIT	1 PROCESSES
A. EPA HAZARD. O WASTENO.	B. ESTIMATED ANNUAL QUANTITY OF WASTE	SURE SURE Cater codes	1. PROCESS CODES (ender) 2. PROCESS DESCRIPTION (if a code is not entered in Del))
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(-3 1) 0 0 1	100	P	T 0 3 D S 0
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ed sund from page 2. htt: Photoscopy this page before completing if you	have more	than 26 wastes to list.	. Form Angroved OMB No. 158-SE0801
CPA I.D. HUMBER tenter from page II	/ / '	FOR OFFICE	TAL USE ONLY 1/7 S D U P
V DESCRIPTION OF HAZARDOUS WAST	ES (contin	The state of the s	D. PROCESSES
A. EPA AZARD. B. ESTIMATED ANNUAL QUANTITY OF WASTE	OF MEA- SURE (enter	1. PROCESS CODES	2. PROCESS DESCRIPTION (if a code is not entered in D(1))
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3 D O O 3			Included with Line 1
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10 0 3		11111	Included with Line 1
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		3 0 2	Included with Line 16
18 D O O 7	7	S 0 2	
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20 D O O 3		S 0 2	
21 D O O 2 555	T	502	Included with Line 21
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V. DESCRIPTION OF HAZARDOUS WAS	ES /cont	1111		Taller of the second se	or in consequence or consequence con consequence or
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PHOTOGRAPHS Rexisting facilities must include photographs (aerial state) and disposal areas; and sites of future store	/ or ground—leve loo_trestment Of	disposal areas (see instr	ructions for mo	re detail).	and the second s	ngalere es
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II. FACILITY OWNER A. If the facility owner is also the facility operator as li		Lon Form 1 "General Info	ormation", place	an "X" in the	box to the left a	ind
A. If the facility owner is also the facility operator as its skip to Section IX below.	step ty Section Att	, dir i ditti i i				
B. If the facility owner is not the facility operator as list	sted in Section VIII	on Form 1, complete the	following items:			×
				2. PHON	ie No. (area code	& no.)
1. NAME OF FACIL	ITY'S LEGAL OW	NEK				
				3 30 - 30	13 - 01 62	
3. STREET OR P.O. BOX		. 4. CITY OR TOWN		S.ST.	6. ZIP CODE	V
	Ğ					
13	15 1 15		10	11_121l		
COWNER CERTIFICATION certify under penalty of law that I have personally		a fraction with the info	rmation submit	ted in this	and all attached	1
certify under penalty of law that I have personally a accuments, and that based on my inquiry of those in	examined and an ndividuals immed	liately responsible for o	btaining the in	formation,	I believe that th	10
Dmitted information is true, accurate, and complete	te. I am aware th	at there are significant p	penalties for su	bmitting (a)	ise miornation	,
acluding the possibility of fine and imprisonment.				C. DATE SI		
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A. NAME (print or type)	B-SIGNATURE		21	C. DATE S		
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PAGE 4 OF 5

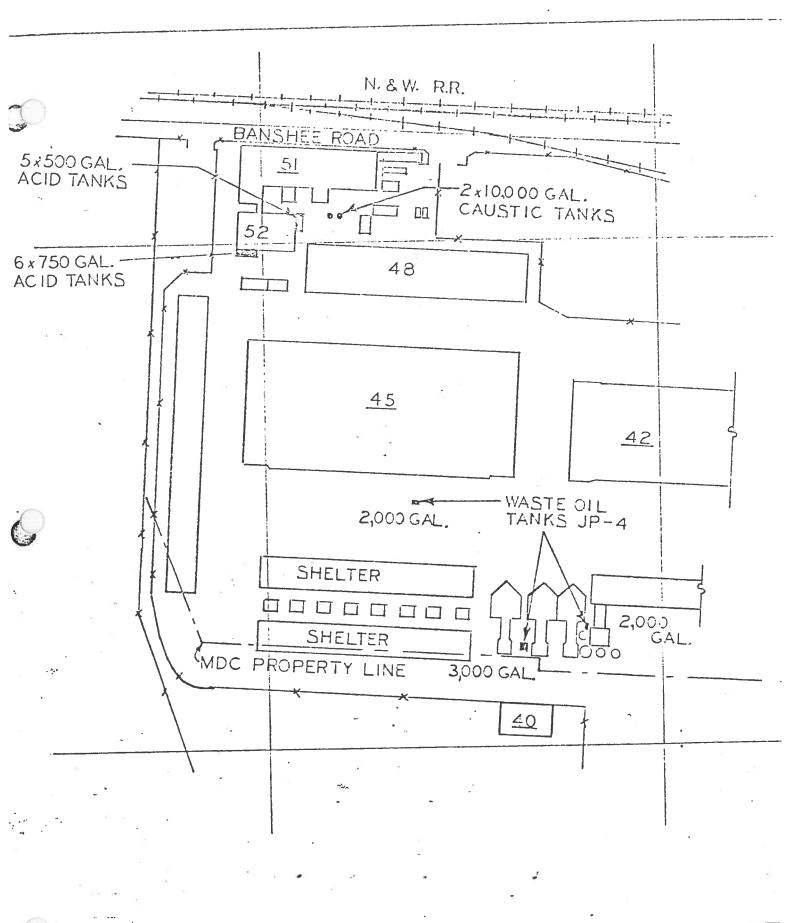
* Form 3510-3 (6-50)

V. FACILITY DRAWING (see page 4)

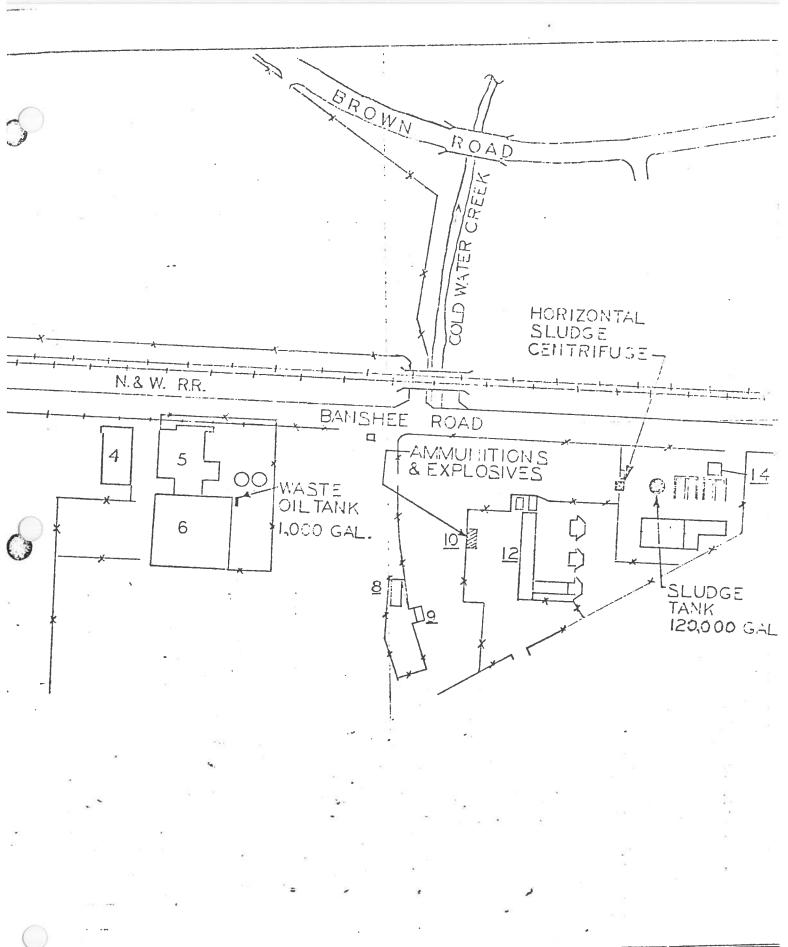
SEE ATTACHED DRAWINGS

SKPE 1280 SHEETS 2, 3, 4

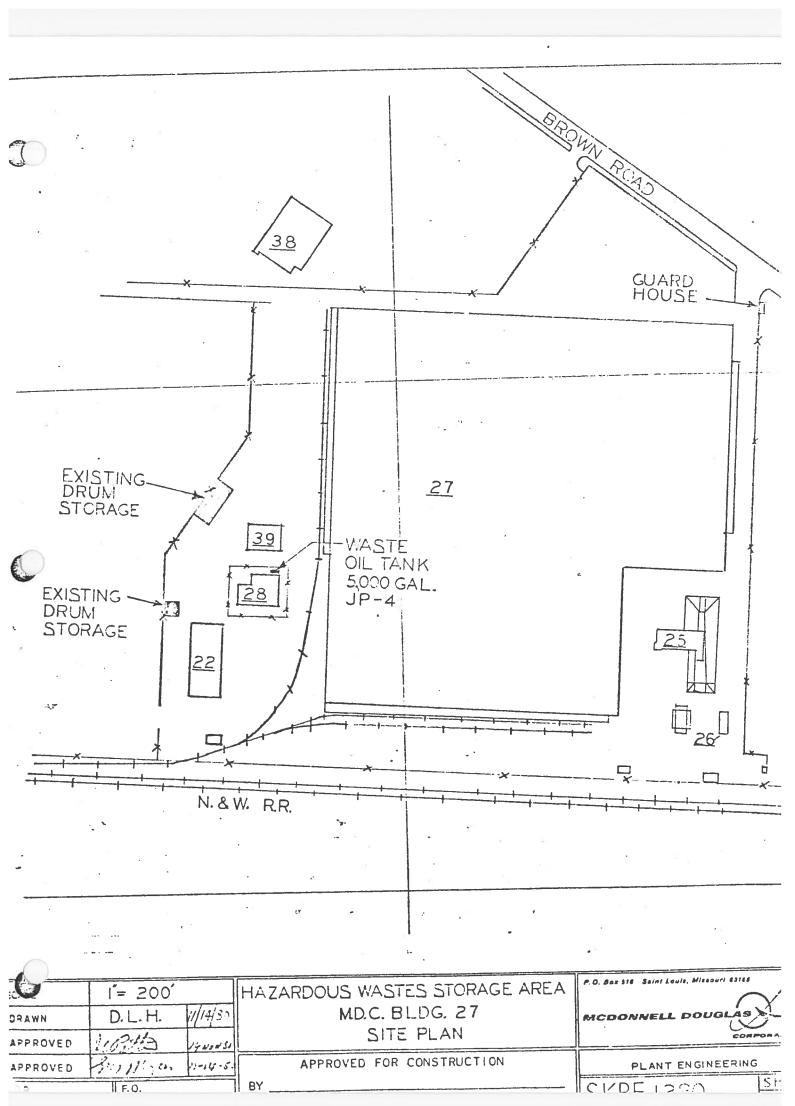
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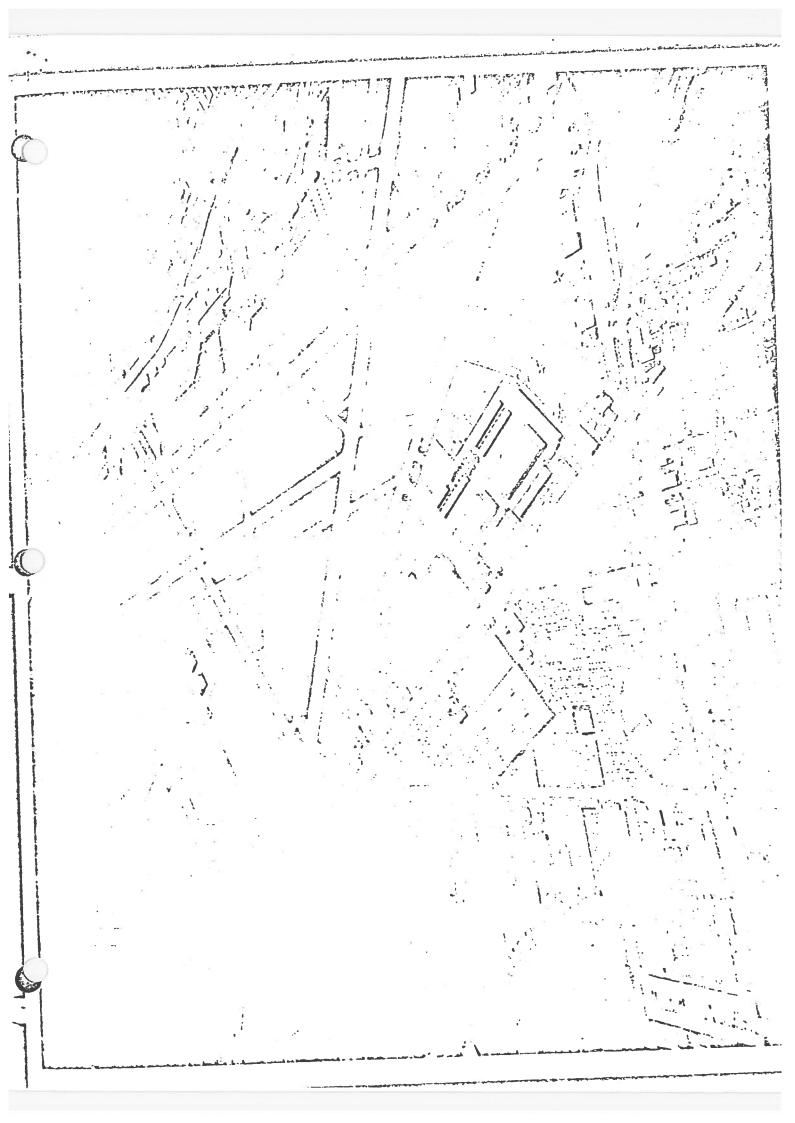


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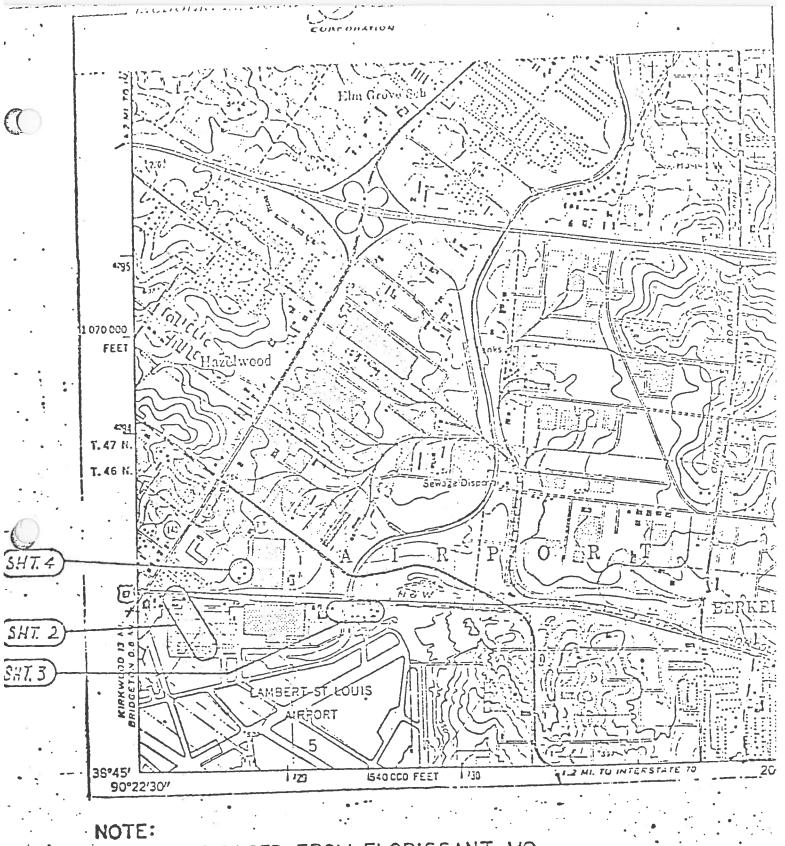




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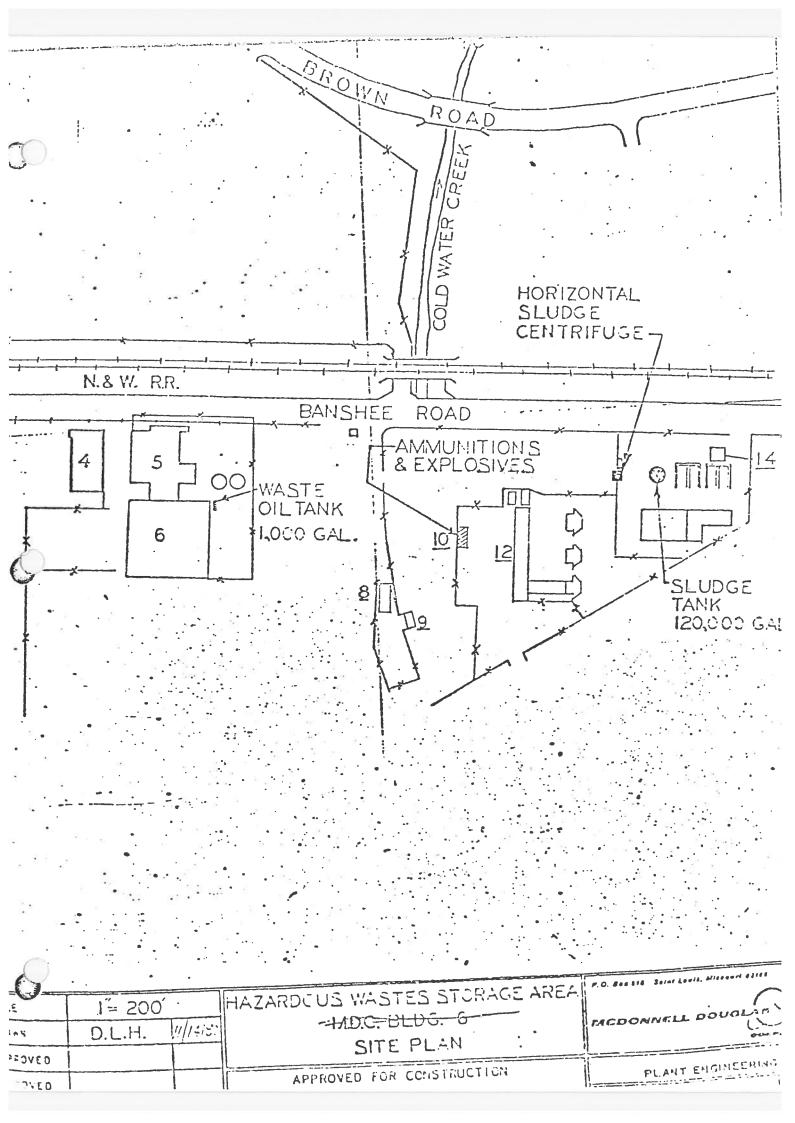
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ELVISED APPLICATION (power on "A" below and complete Item Labore)	2. FACILITY HAS A RORA PERMIT
LIL FACILITY HAS INTURIM STATUS	
3.7 3.4 C Larry 1	to be used at the facility. Ten lines are provided
FROCESS CODE — Enter the code from the list of process codes below that best describes each process entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be use describe the process final using its design capacity) in the space provided on the form (Item III-C).	
2. FROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.	to the state describes the soil of
 AMOUNT — Enter the amount. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure used. Only the units of measure that are listed below should be used. 	t measure codes below that describes the difficult
PRO. APPROPRIATE UNITS OF	PRO- APPROPRIATE UNITS COMES MEASURE FOR PROCES
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EXAMPLE FOR COMPLETING ITEM III (shown in line numbers X-1 and X-2 below): A facility has two starting from the facility also has an incinerator that can burn up to 20 gallons per hour.) Scorage mins, one min control
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B. PROCESS DESIGN CAPACITY # A. PRO- B.	PROCESS DESIGN CAPACITY
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PAGE 1 OF 5	-

DESCRIPTION OF HAZARDOUS WASTES	क्ष्मा <u>क्ष कर्मान्य को श्रे</u> त्र को क्षेत्र के क्षेत्र के क्ष्मान के अपने का क्षेत्र क			حيوم مستر وترز	The fact of the second
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DESCRIPTION OF HAZARDOUS WASTES A HAZARDOUS WASTE NUMBER — Enter the four-digital hazardous wastes which are not listed in 40 CFR, Substitute hazardous wastes which are not listed in 40 CFR, Substitute hazardous wastes	a number trom all their budgett of the	113(23 1.02.5		1 41 -	
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STIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual 25. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed wastels) that will be handle that possess that characteristic or contaminant.

INIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used end the appropria ades are:

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records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking in the appropriate density or specific gravity of the waste.

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A salect the code/s/ from the list of process codes contained in Item to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process con contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that passes

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" extreme right box of Item IV-D(11; and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

ME: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described re than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Selectione of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B.C. and D by estimating the total ann quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line er "included with above" and make no other entries on that line.

3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

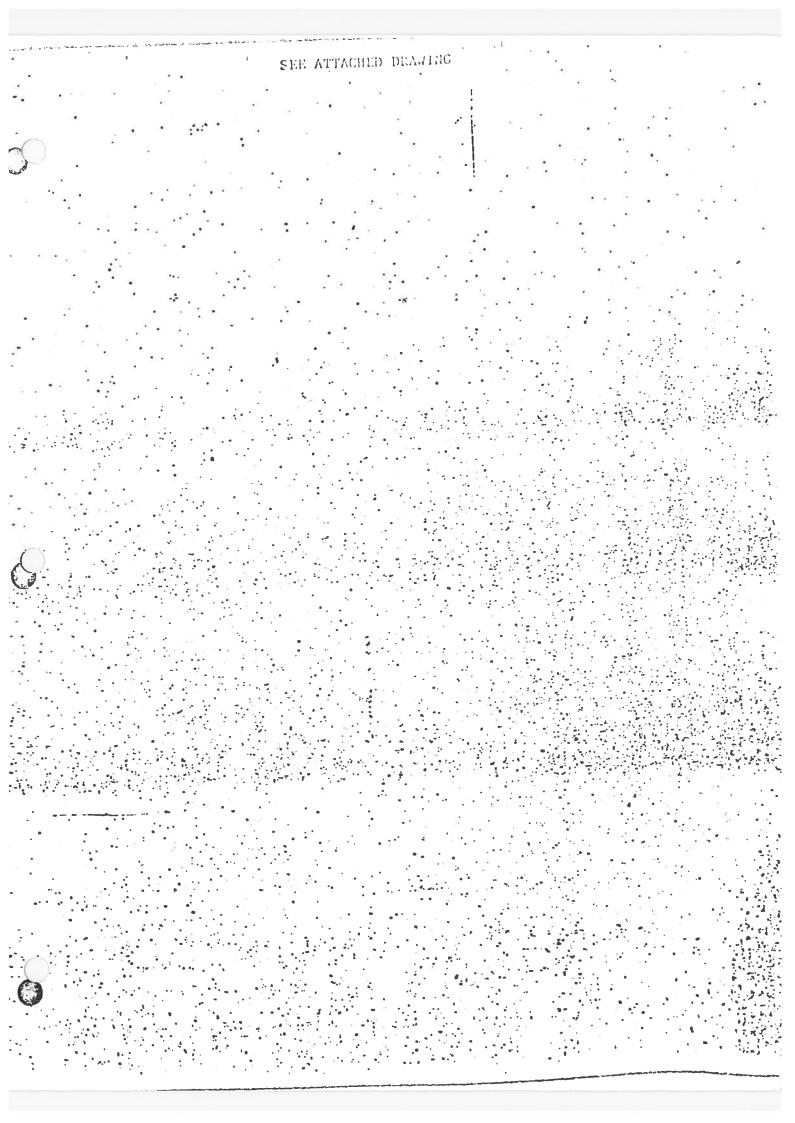
KAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) — A facility will treat and dispose of an estimated 900 pour ryear of chrome snavings from leatner tanning and finishing operation. In adultion, the facility will treat and dispose of three non-listed wastes. Two wa a corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated Depends per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

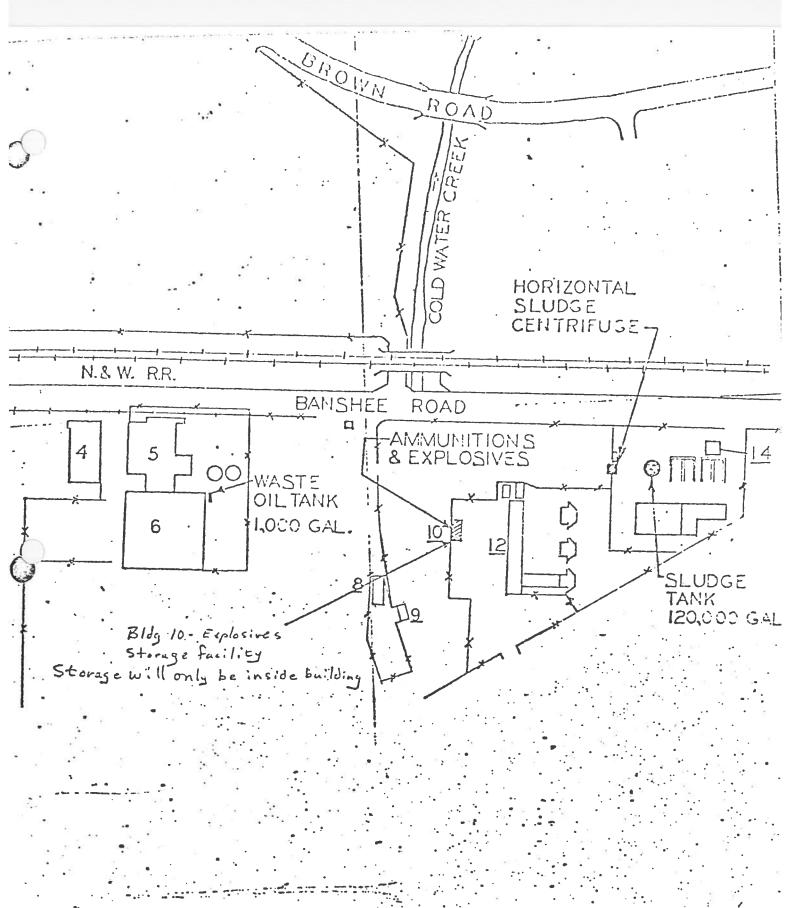
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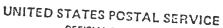


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OFFICIAL BUSINESS

SENDER INSTRUCTIONS

Print your name, address, and ZIP Goda in the space below.

- Complete items 1, 2, and 3 on the reverse.
- Attach to Iront of article if space permits, otherwise affix to back of article.
- Endorse article "Ratum Receipt Requested" adjacent to number.

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RETURN TO

TIM GURGEN

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(City, State, and ZIP Code)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII P. O. BOX 15606 KANSAS CITY, MISSOURI - 64106

REGIDEUSO PADERSO

ACKNOWLEDGEMENT OF APPLICATION FOR A HAZARDOUS WASTE PERMIT

This is to acknowledge that the Environmental Protection Agency has received: (1) A notification pursuant to Section 3010 of the Resource Conservation and Recovery Act for the facility located at the address shown in the box below, and (2) Part A of a Hazardous Waste Permit Application for that facility, including a signed statement that the operation of the facility, or its construction, began prior to November 19, 1980. While the information provided by these submissions has not been fully reviewed for completeness or accuracy, EPA will accept this information as an initial qualification for interin status pursuant to Section 3005 of the Act. If after further: review of this information, EPA determines that the owner or operator did not fulfill all the requirements for interim status, EPA may treat the owner or operator as not having qualified for interim status pursuant to that section and will advise the owner or operator of that determination. Facility owners and operators with interim status must comply with the standards set forth at 40 CFR Part 265 until a permit is issued. Interim status may be terminated if the owner or operator fails to furnish any additional information requested by EPA in order to process a permit application.

EPA I.D. NUMBER

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FACILITY ADDRESS

63145



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII 324 EAST ELEVENTH STREET KANSAS CITY, MISSOURI - 64106

BENOVS IL

October 26, 1981

Mr. Jerome Patterson
Supervisor -McDonnel Douglas Corp.
St. Louis Tract I
P.O. Box 516, Dept. 191C
St. Louis, Missouri 63166

EPA I.D. NO: MOD000818963

FACILITY LOCATION:
McDonnel Douglas Corp., Tract I
Brown Road at Linberg
Hazelwood, Missouri 63145

Dear Mr. Patterson:

We have conducted a technical Review of your Resource Conversation and Recovery Act (RCRA) Hazardous Waste Notification form and Part A permit application. In order to complete our review we are requesting clarification on several items. These items were discussed briefly with you by telephone on October 20, 1981.

Discarded Commercial Chemical Products (U013, U188):

You are advised that in the November 25, 1980, Federal Register on page 78538 (enclosed), asbestos (U013) was removed from the discarded commercial chemical hazardous waste list. Although asbestos is not presently regulated under RCRA, it is regulated under The Toxic Substances Control Act. Please call Wolfgang Brandner or Marvin Frye at 816/374-6538 for specifics.

In your conversation with Mr. Carasea you stated that you purchase a commercial product that contains 10% phenol. In this case, phenol would not be considered hazardous waste U188 under RCRA regulations and should not be listed on your notification form or Part A permit application as U188.

Electroplating Waste Sludges (F006):

November 12, 1980, Federal Register (enclosed) lists several sub-categories of waste which have been exempted from this waste listing (i.e. F006). The exemptions include: 1. Tin plating on carbon steel. 2. Zinc plating (segregated basis) on carbon steel. 3. Aluminum or zinc-aluminum plating on carbon steel. 4. All cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel. 5. Sulfuric acid anodizing of aluminum. 6. Chemical etching and milling of aluminum.

If the process waste consists solely of one of the above electroplating sludges, it can be deleted from your notification form and Part A permit application.

Paint Residues and Sludge Wastes (F017, F018):

In the January 16, 1981, Federal Register (enclosed), the Agency temporarily suspended the FO17 and FO18 wastes from the list of Hazardous Waste from Nonspecific Sources. Since the F017 and F018 listings have been suspended, these wastes would be considered hazardous only if they exhibited one of the hazardous waste characteristics. We are requesting that if these wastes are still handled at the facility then formal testing should be conducted to determine if the wastes exhibit any of the hazardous waste characteristics (i.e. reactivity, ignitability, corrosivity and EP toxicity) as defined in 40 CFR Part 261, May 19, 1980. The results of these tests will determine if the wastes are subject to the regulations.

I am enclosing a blank notification form and a blank Part A permit application. Please make the appropriate changes and return the revised application and notification form to the Environmental Protection Agency (EPA) by November 30, 1981.

If you have any questions, please contact Angelo Carasea at (816) 374-6531 or write to EPA, Region VII, P.O. Box 15606, Kansas City, Missouri 64106-0606

Sincerely yours,

P.E. James L. Foil,

ghief, Technical Support Section

Hazardous Materials Branch

Air and Hazardous Materials Division

Enclosures

John Doyle, MDNR cc:

'cc: Wolfgang Brandner, TOPE

MCDONNELL AIRCRAFT COMPANY

Box 516, Saint Louis, Missouri 63166 (314) 232-0232

04 December 1981

U.S. Environmental Protection Agency Region VII P.O. Box 15606 Kansas City, Missouri 64106

Attention: Mr. James L. Foil, P.E.

Reference: (a) EPA Letter from J. L. Foil to J. C. Patterson dated 26 October 1981

(b) EPA ID No.: MOD 000818963

Enclosure: (1) Revised EPA Forms 8700-12 and 3510-3

REGISTERED MAIL - RETURN RECEIPT

Dear Mr. Foil:

Enclosed you will find our revised forms as requested in Reference (a).

If you have any questions, please contact us.

Sincerely yours,

MCDONNELL AIRCRAFT COMPANY

Jerome Patterson Section Manager Plant Environment

Dept. 191C, Bldg. 102

JCP:bem

IC: A. E. Forry, D. Malvern, R. D. Singleton, Dept. 191C file

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V. DESCRIPTION OF HAZARDOUS WASTES

randle hozardous wastes which are not listed in 40 CFR. Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual casis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed wastels) that will be handled which possess that characteristic or contaminant.

LINIT OF MEASURE — For each quantity entered in column B enter tha unit of measure code. Units of measure which must be used and the appropriate codes are:



POUNDS T METRIC TONS	POUNDSP	METRIC UNIT OF MEASURE CODE KILOGRAMS
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If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

), FROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code/s/ from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by tree than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Salections of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B.C. and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.

3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) — A facility will treat and dispose of an estimated 900 pounds er year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes arrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 22 councis per year of that waste. Treatment will be in an incinerator and discosal will be in a landfill.

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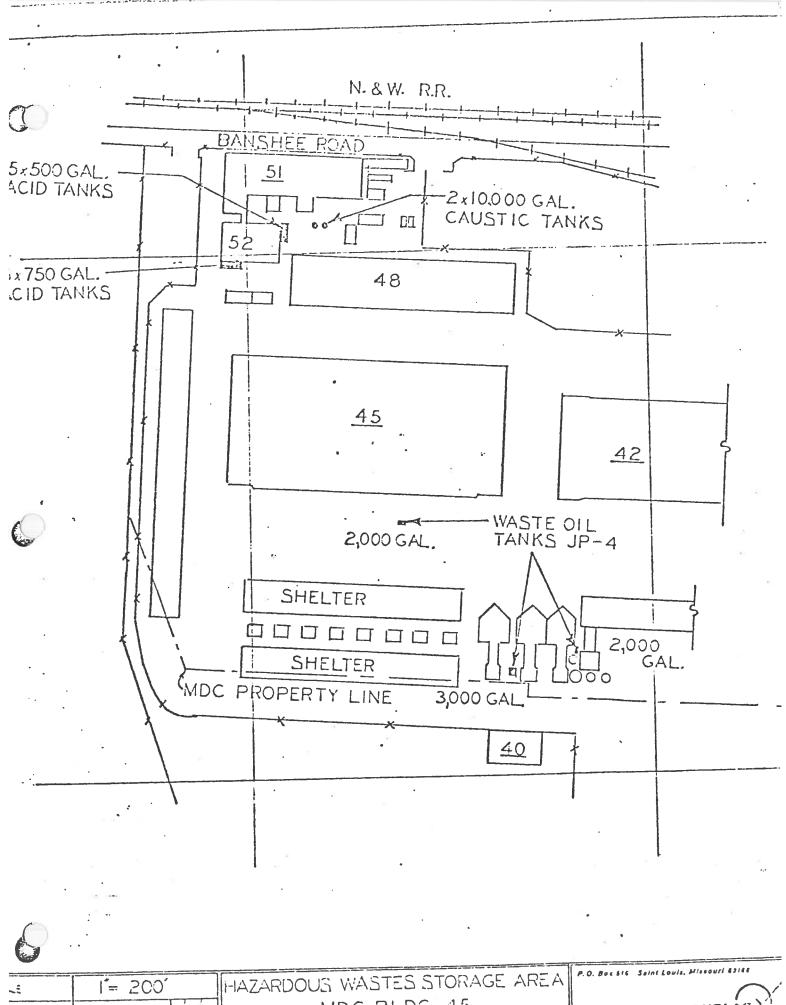
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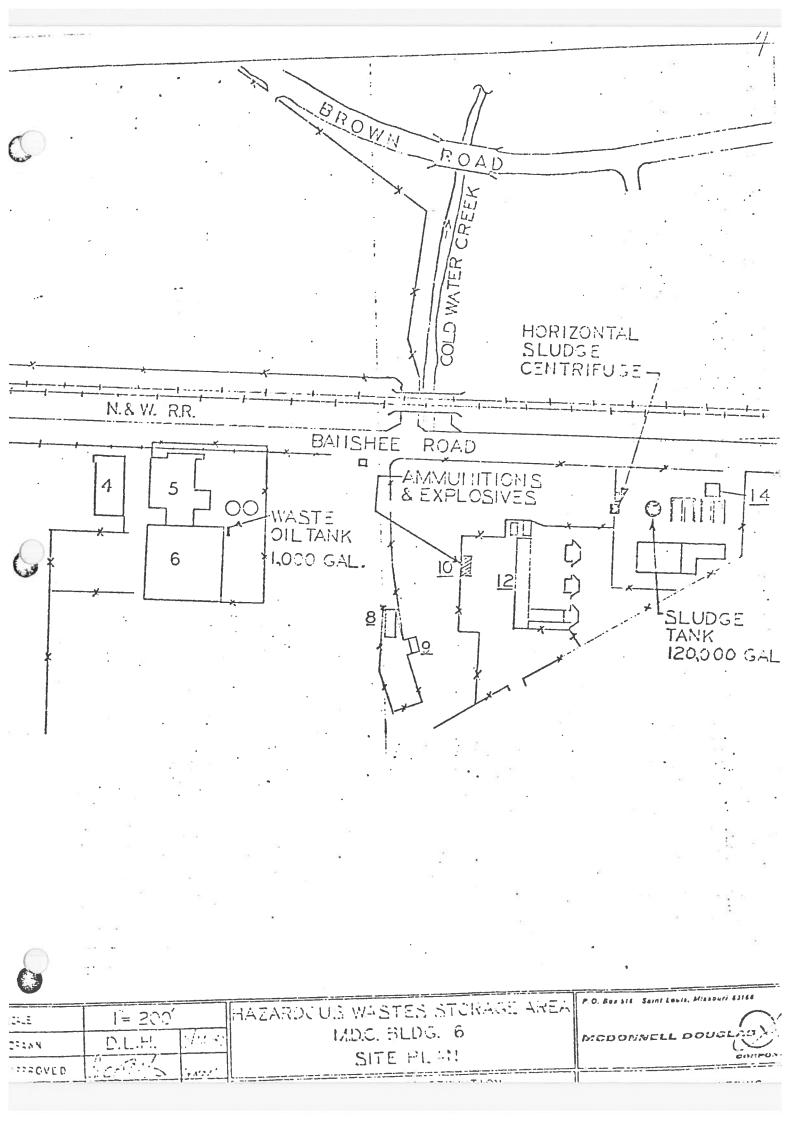
See attached Drawings

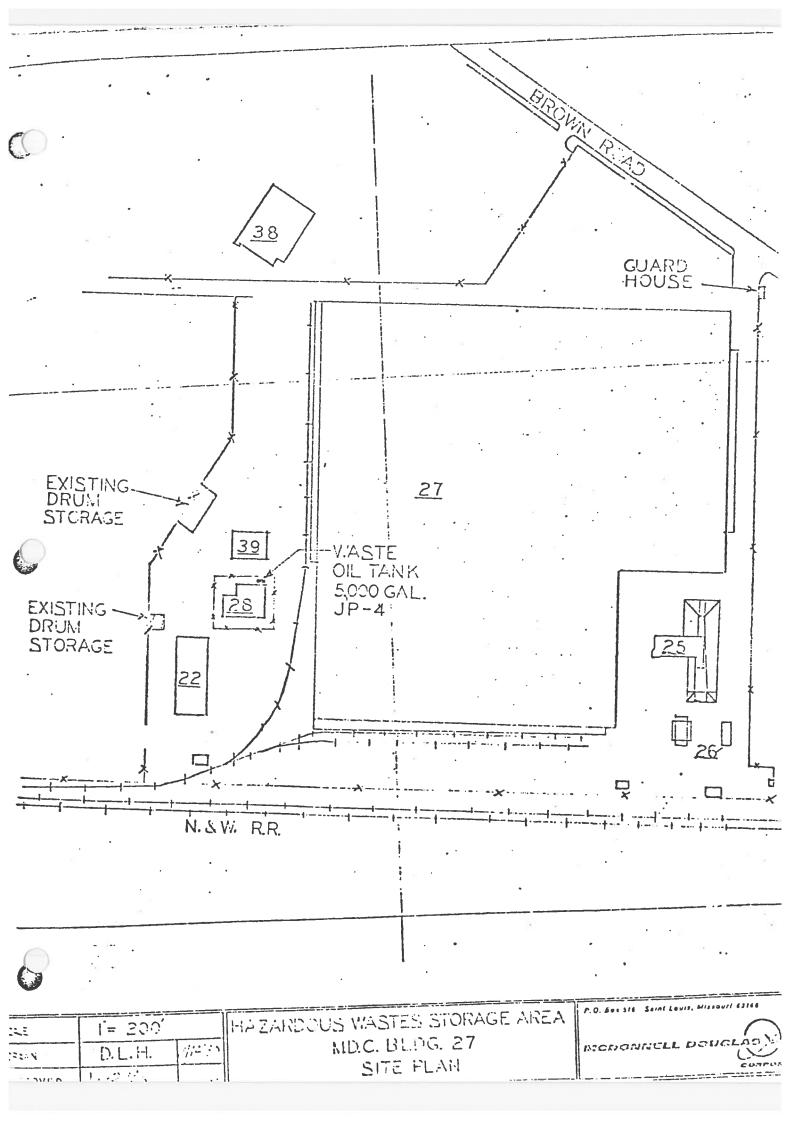
SKPE 1280 Sheets 2, 3, 4





MCDONNELL DOUGLAS







UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII 324 EAST ELEVENTH STREET KANSAS CITY, MISSOURI - 64106 REPROSITION 12 JUNE

March 29, 1982

Mr. Jerome Patterson
Section Manager
McDonnell Douglas Corporation
St. Louis Tract I
P.O. Box 516
St. Louis, Missouri 63166

EPA I.D. NUMBER: MODOO0818963

FACILITY LOCATION:
McDonnell Douglas Corporation
McDonnell Boulevard and Lindberg
Tract I
St. Louis, Missouri 63145

Dear Mr. Patterson:

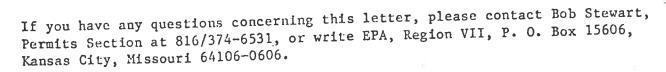
This is to acknowledge that the Environmental Protection Agency (EPA) has completed processing the information submitted in your Part A Hazardous Waste Permit Application. It is the Agency's opinion, based on the assumption that the information submitted is complete and accurate, that you as an owner or operator of a hazardous waste management facility have met the requirements of Section 3005(e) of the Resource Conservation and Recovery Act (RCRA) for Interim Status. EPA has not verified the information submitted. (RCRA) is determined that the information is incomplete or inaccurate, you may If it is determined that the information or in certain circumstances it may be asked to provide additional information or in certain circumstances it may be determined that you do not qualify for Interim Status. In addition, this notice does not preclude a citizen from taking legal action under the provisions of Section 7002 of RCRA.

A facility not meeting the requirements for Interim Status under Section 3005 of RCRA may be required to close until such time as a hazardous waste permit is issued. Interim Status may also be terminated, according to procedures in 40 Code of Federal Regulations (CFR) Part 124, July 1, 1981, if the owner or operator fails to furnish additional information which EPA requests in order to process a permit application.

As an owner or operator of a hazardous waste management facility, you are required to comply with the Interim Status standards as prescribed in 40 CFR Parts 122 and 265, July 1, 1981, or with State rules and regulations in those States which have been authorized under Section 3006 of RCRA. In addition, you are reminded that operating under Interim Status does not relieve you from the need to comply with all applicable State and local requirements.

The enclosure to this letter identifies the processes your facility may use, their design capacities and the types of waste your facility may accept during Interim Status. This information was obtained from the Part A Permit Application. If you wish to handle new wastes, change processes, increase the design capacity of existing processes, or change ownership or operational control of the facility, you may do so only as provided in 40 CFR Sections 122.22 and 122.23, July 1, 1981.





Sincerely yours,

Director, Air and Vaste Management Division

Enclosures (Conditions of Operation During Interim Status)

cc: John Doyle, MDNR

CONDITIONS OF OPERATION DURING INTERIM STATUS

EPA I.D. Number N	101)000318963	Date Prepa	red March 10, 198	2
Facility Mailing A		Facility L	ocation	
McDonnell Douglas		McDonnel1	Douglas Corporation	on
St. Louis Tract I	an paging an papamatana	St. Louis	Tract I	· ·
P.O. Box 516	_	McDonnell	Blvd. and Lindberg	gh Tract
St. Louis, Missou	ri 63166	St. Louis	, Missouri 63145	
and therefore, th	following to be the owner ne person(s) who must comp FR Parts 122 and 265:	or operator of toly with the requi	the facility trements	
Operator's Name	McDonnell Aircraft Corpor	ation		
-	McDonnell Aircraft Corpor	ation		
During the period following process waste, up to the	ally acceptable facility wastes listed below. of interim status, the fees for treating, storing design capacities that ar	acility may use o or disposing of h e indicated:	aly the	
Process Code	(Units)	1100000	(Units)	
S01	37,620 G			-
S02	160,000 G	9 4	•	-
S03	150 Y		(e)	
9 8	. 11			
hazardous wastes	d of interim status, the with the following EPA H exhibiting hazardous charste Numbers using the ass	azardous waste hu acteristics with	the following	
Waste Process	Process Process Proces	s Waste Process	Process Process	Process
D001 501	502	F001 S01	·	35 × 378



Waste	Process	Process	Process	Process	waste	Flocess	1		
0001	S 01	SO2			F001	501	!	g	- 55 · 3035
D002	S01	S02		11	F002	S01	·	S . E	• 12
D003	S01	\$02	so3		F003	S01		8	· ·
D006	S01			=	F005	501	• • •	27%	3 20 3
D007	S01	S02			F005	S01 ,	S02		1

Wast	e Process	Process	Process	Process	Waste	Process	Process	Process	Process
		110000					(9)		
F007	<u>S01</u>								
F008	S01	-					111		
F009	sol							-	
F011	S01								
FO1	9 S01							<u> </u>	
									-
		the state of the s		-					
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23 June 1932

U.S. EPA Region VII 324 East Eleventh Street Kansas City, Missouri 64106

Attention: Mr. Robert Stewart

Permits Section

Reference: EPA I.D. Number MOD 000818963

Enclosure: (1) Outside Photo of McDonnell Aircraft Company Building 10

(2) Inside Photo of Bldg. 10 Looking South

(3) Photo of Typical Containerized Explosive Wastes

(4) Photo Inside Bldg. 10 Looking Southwest(5) Photo Inside Bldg. 10 Looking Northwest

(6) EPA "Conditions of Operation During Interim Status" dated 10 March 1982

(7) Marked-Up Plant Layout Plan 10-1

REGISTERED MAIL - PETURN RECEIPT

Dear Mr. Stewart:

This letter is in response to our previous discussions by telephone and in Jefferson City, Missouri on 04 May 1982 concerning McDonnell Aircraft Company storage of waste ammunition and explosives and the units of storage, container (SO1) vs. waste pile (SO3).

We have enclosed five (5) color photographs (8 inch x 10 inch) which show the outside of our Ammunition Storage Building No. 10, and the inside section of this building that serves as the storage area for waste ammunition and explosives. These photos show the container-ized storage of this waste. In addition, we have enclosed a marked-up layout plan showing the designated waste storage area that appears in the photos.

Based on this information, we request that our "Conditions of Operation During Interim Status" [Encl (6)] be changed FROM

PROCESS CODE	DESIGN CAPACITY (UNITS)					
S01	37,620G					
· SO 2	160,000G					
\$ 03	150Y					



The requested change is based on the fact that we do not store waste explosives in WASTE PILES (SO3), but rather in CONTAINERS (SO1), as shown in the enclosed photographs.

We would appreciate receiving your response concerning our request as rapidly as possible, since we are beginning Part "B" application preparation, and this requested change will affect this application.

If you have any questions, please contact me at (314) 233-9824.

Sincerely,

MCDONNELL AIRCRAFT COMPANY

J. C. Patterson, Section Manager Environmental Pollution Control Dept. 191C, Bldg. 102

JCP:bem

IC: C. P. Johnson

REQUEST FOR CERTIFIED/EXPRESS/REGISTERED MAIL SERVICE FOR CLASSIFIED MATERIAL TO SE DELIVERED WITHIN CONTINENTAL U.S.: FOR CLASSIFIED MAIL FOR CONFIDENTIAL, REGISTERED MAIL FOR SECRET. USE REGISTERED MAIL THROUGH U.S. MILITARY FACILITY. PLEASE SEND ATTACHED: CERTIFIED MAIL EXPRESS MAIL REGISTERED MAIL 1. DOCUMENT CONTROL, RETURN RECEIPT (REGISTERED MAIL ONLY) 2. UNCONTROLLED CORRESPONDENCE: RETURN RECEIPT REQUESTED DATE OF LETTER 23 Jun 82 LETTER REF. NO.
IF NOT CORRESPONDENCE, DESCRIBE
ADDRESSEE: U.S. EPA, Region VII
324 East Eleventh Street
Kangag City Vi
NAME OF SENDED
NAME OF SENDER J. C. Patterson DEPT. NO. 1910 BLDG. NO. 102 POSTAL RECEIPT NO. 76.1507 NO MAIL WILL BE CERTIFIED. EXPRESSED. CO. P. DATE 6.129/82
NO MAIL WILL BE CERTIFIED, EXPRESSED, OR REGISTERED WITHOUT THIS COMPLETED FORM PS From 331 Dec 1931
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII 324 EAST ELEVENTH STREET KANSAS CITY, MISSOURI - 64106 1950282

JUL 14 1982

Mr. J. C. Patterson
Section Manager
McDonnell Douglas Corporation
P.O. Box 516
St. Louis, Missouri 63166

EPA I.D. No.: MOD000818963

FACILITY LOCATION:
McDonnell Douglas Corporation
Tract 1 and Banshee Road, Bldg. 10
St. Louis, Missouri 63145

Dear Mr. Patterson:

We have reviewed your June 23, 1982, letter concerning hazardous waste storage in Building Number 10. Based on the excellent pictures you included, we agree that this storage should be classified as container storage (SO1). We are enclosing a new Conditions of Operation attachment for you to add to our March 29, 1982, letter.

Should you have further questions, please contact Bob Stewart at (816) 374-6531.

Sincerely yours,

Robert L. Morby
Chief, Waste Management Branch
Air and Waste Management Division

Enclosures

cc: John Doyle, MDNR



CONDITIONS OF OPERATION DURING THEFTOTH STATUS

INTERIM STATUS	
EPA I.D. Number MOD000818963	Date Prepared 7/13/82
Facility Mailing Address	Facility Location
McDonnell Douglas Corporation	McDonnell Douglas Corporation
St. Louis Tract I	St. Louis Tract I
P.O. Box 516	McDonnell Blvd. and Lindbergh Trac
St. Louis, Missouri 63166	St. Louis, Missouri 63145
EPA considers the following to be the owner or and; therefore, the person(s) who must comply set forth in 40 CFR Parts 122 and 265:	operator of the facility with the requirements
Operator's Name McDonnell Aircraft Corporation	011
Owner's Name McDonnell Aircraft Corporation	;
The information shown below is based solely of owner and operator of this facility submitted Permit Application. This is not a determinat is an environmentally acceptable facility for	ion by EPA that this facility
of the hazardous wastes listed below.	lity may use only the
During the period of interim status, the faci following processes for treating, storing or waste, up to the design capacities that are i	d19500118
Process Code Design Capacity Process Code (Units)	cocess Code Design Capacity (Units)
S01 37,620 G	
S02 160,000 G	
S03 150 Y (or 30,300 G)	
During the period of interim status, the factorial hazardous wastes with the following EPA Hazardor solid wastes exhibiting hazardous charact EPA Hazardous Waste Numbers using the associ	eristics with the following
Waste Process Process Process	Waste Process Process Proc
D001 S01 S02	F001 S01
D002 S01 S02	F002 S01
D003 S01 S02 S03	F003 S01
D006 S01	F005 S01

S01

D007

100		
ml		
1		
1.3		
	(

Waste	Process	Process	Process	Process	Waste	Process	Process	Process	Process
F007	S01	***************************************		Section of the Control of the Contro		-			
F008	<u>so1</u>								
F009	<u>sol</u>								
FOll	501							-	
F019	S01					0			





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII 324 EAST ELEVENTH STREET KANSAS CITY, MISSOURI - 64106

JUL 21 1982

Mr. J. C. Patterson
Section Manager
McDonnell Douglas Corporation
P.O. Box 516
St. Louis, Missouri 63166

28 JePallin

FACILITY LOCATION:
McDonnell Douglas Corporation
Tract 1 and Banshee Road, Bldg. 10
St. Louis, Missouri 63145

Dear Mr. Patterson:

In our letter to you dated July 14, 1982, we agreed that your hazardous waste process SO3 should be classified SO1. The Conditions of Operation attachment to that letter failed to reflect that change. Enclosed is the corrected Conditions of Operation. Please substitute these Conditions of Operation for the ones dated July 13, 1982.

Sincerely yours,

Robert L. Morby

Chief Waste Management Branch Air and Waste Management Division

Enclosure

cc: John Doyle, MDNR

CONDITIONS OF OPERATION DURING INTERIM STATUS

EPA I.D. Number MODO	00818963		Date Prepare	d 7/20/82	_ 🐵							
Facility Mailing Add	ress		Facility Loc	ation								
McDonnell Douglas Co	rporation		McDonnell D	ouglas Corporatio	n							
St. Louis Tract I			St. Louis T	ract I								
P.O. Box 516	To the state of th		McDonnell B	lvd. and Lindberg	h Tract							
St. Louis, Missouri	63166	= "2	St. Louis,	Missouri 63145								
EPA considers the for and; therefore, the set forth in 40 CFR	ollowing to be the own person(s) who must co Parts 122 and 265:	ner or op omply wit	erator of the h the require	facility ments								
Operator's Name McI	Donnell Aircraft Corp	oration										
Owner's Name McI	Donnell Aircraft Corp	oration										
owner and operator of Permit Application. is an environmental.	The information shown below is based solely on the information that the owner and operator of this facility submitted in Hazardous Waste Part A Permit Application. This is not a determination by EPA that this facility is an environmentally acceptable facility for treating, storing or disposing of the hazardous wastes listed below.											
following processes	f interim status, the for treating, storin sign capacities that	g or disp	osing or naza	<u>y</u> the ardous								
Process Code	Design Capacity (Units)	Proces	ss Code	Design Capacity (Units)								
S 01	67,920 G											
S02	160,000 G	<u> </u>	8									
	10 1 N 0											
(44 9048) 14 M2 N				1.	,							

During the period of interim status, the facility may handle only
bazardous wastes with the following EPA Hazardous Waste Numbers, and/
or solid wastes exhibiting hazardous characteristics with the following
EPA Hazardous Waste Numbers using the associated process code(s):

Waste	Process	Process	Process	Process	Waste	Process	Process	Process	Proces
D001	<u>501</u>	so2		·	F001	<u>so1</u>		-	-
D002	<u>s01</u>	S02			F002	<u>so1</u>			
D003	<u>sol</u>	S02			F003	<u>so1</u>			
D006	501			-	F005	<u>so1</u>			
5007	001	cni			E006	S01	S02		





Waste	Process	Process	Process	Process	Waste	Process	Process	Process	Process
F007	S01								·
F008	<u>sol</u>								
F009	S01								
F011	S01								
F019	S 01								

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SECTION B

FACILITY DESCRIPTION

This section provides a general description of the Hazardous Waste Management Facility as required by 40 CFR 122.25(a). This description is intended to acquaint the Permit Application Reviewer/Permit Writer with an overview of the facility. More complete information and technical details may be found in other sections of this Permit Application.

B-1 General Description [40 CFR 122.25(a)(1)][10 CSR 25-7.011(2)(c)]

The facility described in this permit application is the Tract I facility of the McDonnell Aircraft Company (note that references in this application to McDonnell Douglas Corporation and/or McDonnell Aircraft Co. refer to the same facility, and are used interchangeably), located along the northern property line of the Lambert-St. Louis International Airport. It is further bounded by Lindbergh Blvd. and James S.

McDonnell Blvd. (38°-45'25" north latitude, 90°-21'-55" west longitude).

The street address is: McDonnell Douglas Corporation
(Tract I)

James S. McDonnell Blvd. at Lindbergh Blvd.

St. Louis, Missouri 63145

(NOTE: James S. McDonnell Blvd. was formerly Brown Road)

The mailing address is: McDonnell Douglas Corporation

Plant Engineering, Dept. 1910

P.O. Box 516

St. Louis, Missouri 63166

This facility is primarily a manufacturing site for high technology aerospace products including military fighter aircraft, space systems, and missiles. Hazardous wastes generated at this facility are those generally associated with the fabrication of aluminum, titanium, composite structures, and other materials used in the manufacture of airframes, etc. Examples of processes involved are:

Chemical Processing Tanks

Metal Cutting, Forming, and Grinding

Degreasing Operations

Painting Operations

Attachment B-1, McDonnell Douglas Corporation 1981 Annual Report, is included to acquaint the Permit Application Reviewer with the nature of the business conducted by the McDonnell Douglas Corporation.

The company contact for all Hazardous Waste management activities is:

Jerome C. Patterson

Section Manager, Dept. 1910

Aircraft Fueling Operations

McDonnell Douglas Corp.

P.O. Box 516

St. Louis, Missouri 63166

Phone: (314) 233-9824 or (314) 232-3319

Emergency 24-hour phone: (314) 232-0232

B-2 Topographic Maps - Facility Plan, etc. [40 CER 122.25(a)(1a)] [7.011(2)(c)2] Figure B-1 is a Topographic Map showing the facility boundaries and the surrounding areas for a distance of 1,000 feet around the facility. Also shown is the 100 year flood plain. (Fed EPA Requirement)

Figure B-2 is a similar Topographic Map encompassing a distance of 1 mile around the facility. (MO.DNR Requirement)

Figure B-3 is the MDC St. Louis Tract I Facility Plan showing easements, buildings, fire hydrants, perimeter fencing, and predicted boundaries of the 100 year flood plain.

Figure B-4 is the MDC St. Louis Industrial Property Map showing not only MDC buildings, parking lots, etc., but other industry and residential properties within the vicinity.

Figure B-5 is the latest official St. Louis County Land Use Map.

Figure B-6 is the MDC St. Louis Tract I Civil Engineering Map showing underground storm, sanitary and industrial waste sewers.

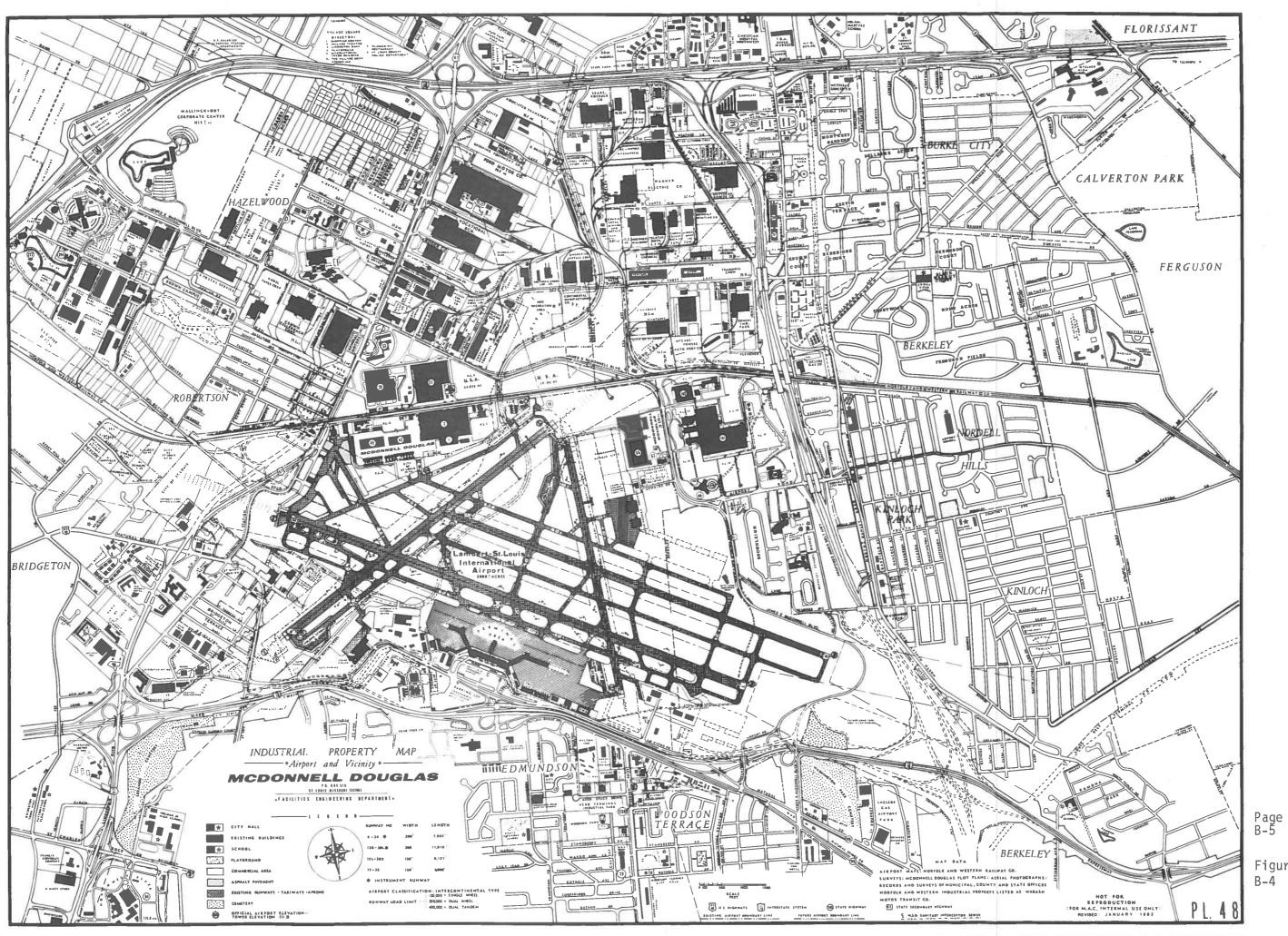
Figure B-7 is the MDC ST. Louis Tract I Traffic Flow Patterns. This subject is discussed in paragraph B-4 of this section.

Figure B-8 is the Lambert-St. Louis International Airport wind rose.

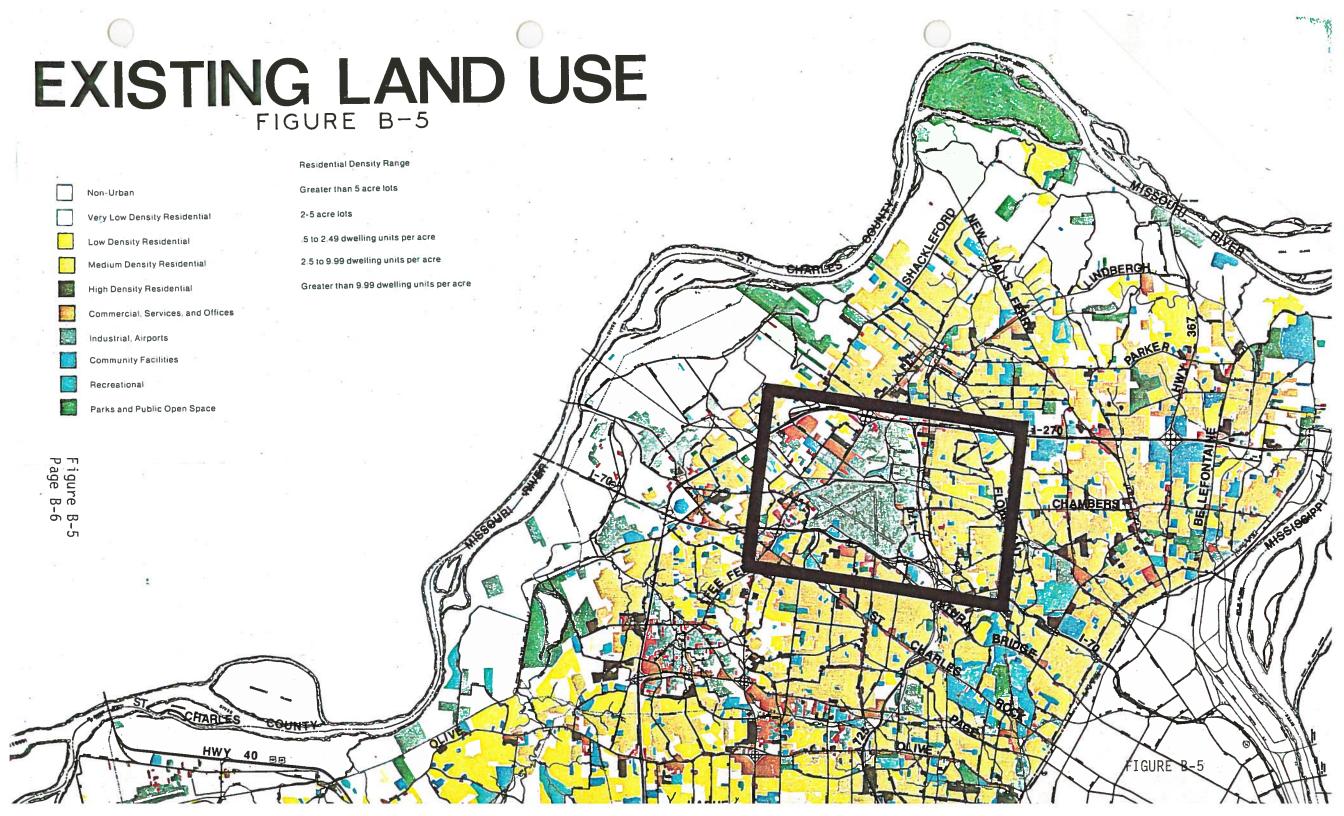
Note - In view of their large size, Figures B-1, B-2, B-3, B-6 and B-7 are included in a separate packet at the end of this Permit Application.

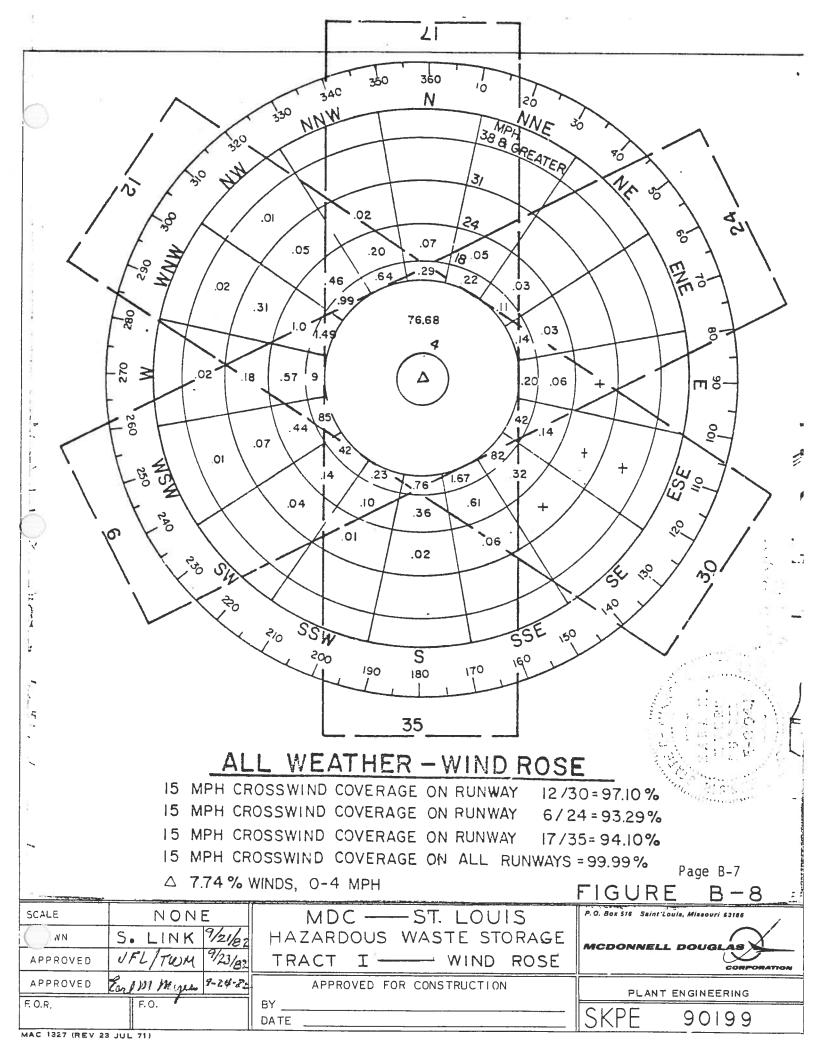
DATE: 6 OCT 1982 REVISION NO.: 0 (B)

NOTE - In view of their large size, Figures B-1, B-2, B-3, B-6 and B-7 are included in a separate packet at the end of this Permit Application.



Figure





<u>Injection and Withdrawal Wells</u> - There are no injection and/or withdrawal wells at this facility. There are no known injection or withdrawal wells within the vicinity covered by this Permit Application.

The subjects of access to the facility, fire prevention and control and facility security procedures are discussed in detail in other sections of this Permit Application.

- B-3 Location Information [40 CFR122.25(a)(11) and 265.18] [7.011(2)(c) and (3)(k)
- B-3a Seismic Standard

 This facility is not located in the Seismic Areas as defined in

 [40 CFR 265.18(a) and 122.25(a)(11)(i) and (ii)]

It also is an existing facility to which these standards do not apply.

- B-3b Flood Plain Standard [40 CFR 122.25(a)(11(iii) and 265.18(b)]

 The Hazardous Waste Storage Facilities located within this facility are not in the 100 year flood plain.
- B-3b(1) Demonstration of Compliance

 Does not apply, see B-3b.
- B-3b(1)(a) Flood Proofing and Flood Protection Measures

 Does not apply, see B-3b.
- B-3b(1)(b) Flood Plain

 Does not apply, see B-3b.
- B-3b(2) Plan for Future Compliance
 Does not apply, see B-3b.

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B-4 <u>Traffic Patterns [40 CFR 122.25(a)(10)]</u>

The MDC-St. Louis facilities are in the southeast corner of the intersection of Lindbergh and McDonnell Boulevards. Access to the McDonnell Douglas Storage Facilities is off McDonnell Blvd., Lindbergh Blvd., or Banshee Road.

Figure B-7 shows the onsite traffic pattern. The main road, parking lots, and dead-end roads are two-way. Most cars are confined to the parking lot and entrance road. Within the plant, traffic vehicles consist mostly of fork lifts and trucks. Numerous trucks and semitrailers enter the plant each day.

Traffic Control: Traffic is controlled by stop signs, traffic lights, and security guards. These are also indicated in Figure B-7.

Access Road Surfacing: All roads are constructed of either bituminous concrete pavement (blacktop) over a gravel base or bituminous concrete pavement over a concrete base.

Load-Bearing Capacity: All roads are capable of bearing loads up to 16,000 pounds per a single axle, or 32,000 pounds per a tandem axle. The bulk tanker truck or van trailers used to remove inventory from the tank storage or drum storage area have an empty weight of approximately 28,000 pounds, and a loaded weight of approximately 72,000 pounds. Therefore, the facility roads can bear the weight of the trucks.

Traffic Control Signals: The traffic control signal lights are controlled by MDC Security Guards when not on blinking yellow caution.

The following is the estimated volume of daily traffic at the specified storage areas:

Container Area No. 1 - 30 tugs/forklifts; 3 cars/trucks; 0 aircraft.

Container Area No. 2 - 6 tugs/forklifts; 6 cars/trucks; 0 aircraft.

• • •

B-4 (Continued)

*Tanks H-19 and H-20 - 10 tugs/forklifts; 1 car/truck; 0 aircraft.

Tanks H-12, 13, 14, 15, 16 - 10 tugs/forklifts; 1 car/truck; 0 aircraft.

Tanks H-1, 2, 3, 4, 5, 6 - 9 tugs/forklifts; 1 car/truck; 0 aircraft.

*Hush House Waste Tank - 4 tugs/forklifts; 0 cars/trucks; 0 aircraft.

*Fuel Pit No. 3 Waste Tank - 2 tugs/forklifts; 0 cars/trucks; 2 aircraft.

*Fuel Pit No. 4 Waste Tank - 2 tugs/forklifts; 0 cars/trucks; 2 aircraft.

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*F-18 Silencer Waste Tank - 1 tug/forklift; 0 cars/trucks; 0 aircraft.

*Bldg. 28 Waste Tank - 0 tugs/forklifts; 0 cars/trucks; 0 aircraft.

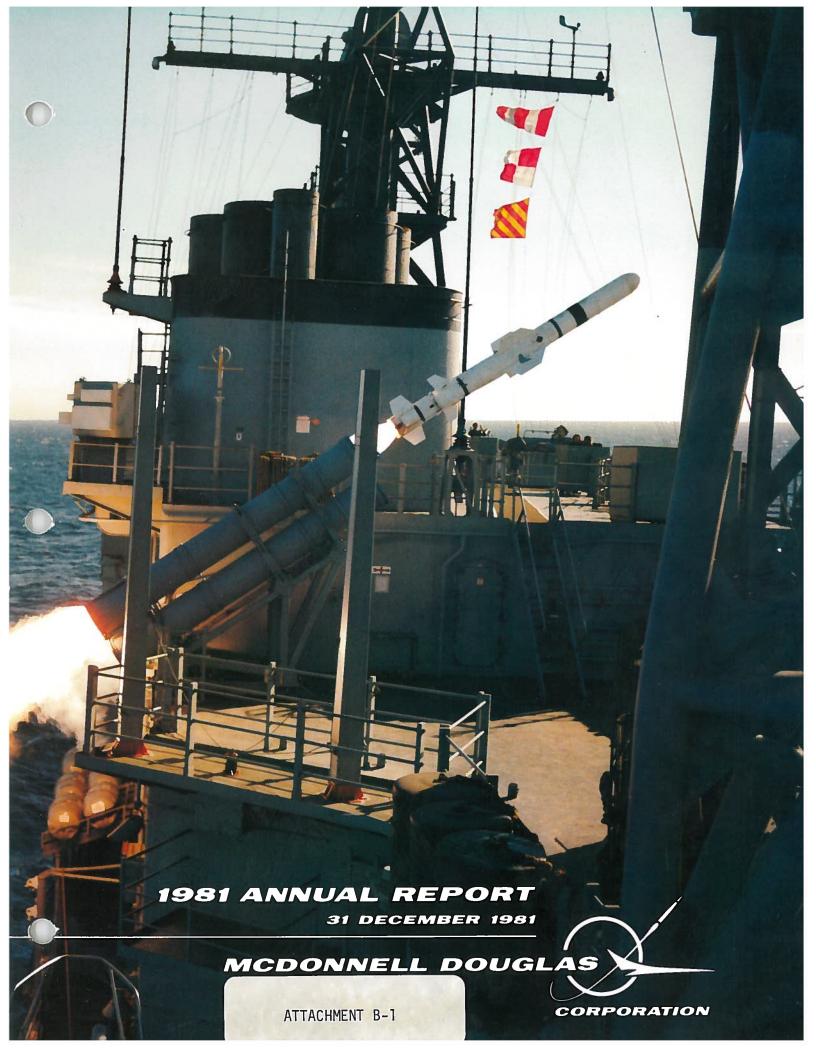
*Ramp Stations 1 and 2 Waste Tank - 4 tugs/forklifts; 0 cars/trucks; 2 aircraft.

R

*Bldg. 6 Waste 0il Tank - 0 tugs/forklifts; 0 cars/trucks; 0 aircraft.

Bldg. 14 Sludge Holding Tank - 0 tugs/forklifts; 1 car/truck; 0 aircraft.

* Waste from these areas is recycled, and therefore is exempt from federal hazardous waste regulation under RCRA.







McDonnell Douglas Corporation

McDonnell Douglas Corporation's major lines of high-technology aerospace products include military and commercial aircraft, space systems and missiles. In addition, MDC has rapidly growing smaller lines of business in computers and data processing services, commercial financing and leasing, and emerging lines in several other fields. According to the most recent listings, MDC ranks 53rd in sales among the largest industrial corporations in the U.S., eighth in value of exports, and first in defense contract awards. Major manufacturing facilities are situated in St. Louis, Mo.; Long Beach and Huntington Beach, Calif.; Tulsa, Okla., and Toronto, Canada.

HIGHLIGHTS		
YEARS ENDED 31 DECEMBER (Dollar amounts in millions, except share data)	1981	1980
Sales	\$7,384.9	\$6,066.3
Net earnings As % of sales	\$176.6 2.39%	\$144.6 2.38 <i>%</i>
Earnings per share	\$4.44	\$3.65
Cash dividends declared	\$41.2	\$34.4
Shareholders' equity per share on 31 December	\$42.93	\$39.50
Working capital on 31 December	\$374.8	\$608.4
Firm backlog on 31 December (see page 30)	\$8,857.8	\$8,815.5
Personnel on 31 December	74,264	82,550

Contents

Par

- 1. Financial Highlights
 - hlights 16. Financial Section
- 2. Letter to Shareholders 32. Corporate Directory
- 4. Report on Programs



TO SHAREHOLDERS AND CO-WORKERS

McDonnell Douglas Corporation's 1981 sales and earnings were both about 22% above those of 1980.

The 1981 earnings were adversely affected by a fourth-quarter pre-tax provision of \$50 million — \$25.5 million after taxes — for probable restructuring or default of commercial aircraft financing transactions. A loss of approximately that amount is expected to be charged against the provision as a result of the bankruptcy of Laker Airways of Great Britain in February 1982.

Improvement was further limited by the fact that MDC incurred \$58 million more in interest costs — \$29.6 million more after taxes — in 1981 than in 1980.

Earnings in 1980 were affected by two unusual events: an after-tax gain of \$15.5 million from a real estate transaction, and an after-tax write-off of \$32 million in DC-9 program costs.

Sales were higher in 1981 in all product lines, with the greatest increase occurring in military aircraft. Operating earnings increased in all product lines except commercial aircraft, where a 1981 loss of \$85 million — a figure which includes the fourth quarter's \$50 million provision — was an improvement over 1980's \$144.3 million loss.

The past year has brought both increased opportunities and greater risks to the U.S. aerospace industry. Increased emphasis on defense has been very positive for military aerospace business. In the

commercial aircraft market, however, worldwide recession coupled in the U.S. with the effects of deregulation and 1981's air traffic controllers strike has continued to reduce the ability of airlines to order new equipment.

Orders for new wide-cabin aircraft fell, in 1981, well below 1980's low level, and many used aircraft of this type have been placed on the market. One result was Lockheed Corporation's December 1981 announcement of plans to phase out production of its L-1011 airliner, a direct competitor of our DC-10. Another result was the fact that as of the end of 1981 MDC had no firm orders for DC-10s to be delivered in 1983. In adjusting to this situation we have provided substantial amounts of additional financing to our airline customers and have carried increased amounts of unsold aircraft in inventory. At year-end this inventory included two DC-10s on which production was nearly complete and nine essentially complete DC-9s for a customer not yet able to take delivery.

Demand for airliners with less passenger capacity than the wide-cabin jets also has been affected by current conditions, though not so severely. DC-9 twin-jets were delivered to customers at a high rate throughout 1981, but this occurred in large part because DC-9 deliveries had been delayed in 1980. In the middle of 1982, when the backlog of delayed deliveries is eliminated, DC-9 production rates will decline substantially.

The cyclical history of the industry suggests that the present problems of airlines and airliner manufacturers will be followed in time by increased traffic and a resurgence of orders for new equipment. When



JOHN F. MCDONNELL
President

SANFORD N. MCDONNELL Chairman and Chief Executive Officer

such a turnaround occurs, we should be able to capture a significant share of growing markets with the jetliners that we now have in production, derivative versions of them, and possible new models.

We expect, for example, that demand for wide-cabin aircraft of the DC-10's type will be substantial in the mid-1980s and beyond. To reach this market, however, we will have to sell enough aircraft to keep production of current models at a minimally acceptable rate until the current slump ends. We will also need to develop derivative models. Such models, which are already being discussed with prospective customers, would be equipped with the latest in advanced engines and would offer significant operating cost improvements. Developing them would require additional investment and will be undertaken only after thorough analysis of costs, timing and market outlook.

The problem of maintaining an acceptable DC-10 production rate could be partly solved by U.S. Air Force purchase of the KC-10 tanker-cargo aircraft, which as a military version of the DC-10 is manufactured on the same assembly line. The federal budget for fiscal year 1982 includes funds for four KC-10s to be delivered in 1983, and in January 1982 the Air Force announced plans — subject to Congressional action — to purchase 44 additional KC-10s.

Such an increase in KC-10 orders could have a favorable impact on production rates. But if DC-10 orders remain at extremely low levels, and if annual production of the KC-10 were held to very low levels also, it could become necessary to close the assembly line. As we have previously reported, this would cause substantial write-offs.

We suffered a setback in our efforts to achieve a more even balance of commercial and government transport aircraft sales when, in January 1982, the Air Force announced that it does not plan full-scale development of the C-X advanced cargo aircraft program at this time. MDC won a competitive source selection for development and production of the C-X late in 1981.

Balancing the problems and uncertainties of the transport aircraft market, MDC has a formidable array of competitive strengths. One of these is the diversity of our products and the markets they serve. Another is the reputation for excellence that each of our major products has earned.

Conspicuous among our strengths is MDC's stature as the world's leading producer of combat aircraft. No other company has a range of products comparable to

our F-15 Eagle, F-18A Hornet and AV-8B Harrier II. The past year has brought positive developments in each of these programs. One of the most gratifying occurred last October in Australia, where the Hornet was named winner of an intensive fighter selection competition. The fact that this was the Hornet's second consecutive success in foreign competition is testimony not only to the aircraft's superior performance but to its cost-effectiveness as well. It is estimated that 20 years of Hornet service will save the U.S. Navy and Marine Corps \$9 billion in operating and support costs. These savings will result primarily from the fact that the F-18 uses less fuel and requires less maintenance than the two aircraft it is replacing.

The past year has also brought evidence that MDC is broadening its capabilities as a military aircraft producer. The U.S. Strategic Air Command took delivery of its first KC-10s in 1981, and in service these aircraft have demonstrated both high performance and high efficiency. Our 1981 victories in the C-X transport and VTXTS jet trainer competitions occurred in areas of military aircraft technology in which other aerospace firms have traditionally occupied leadership positions.

We are continuing to demonstrate strength in information systems, where revenues again grew rapidly in 1981. We also remain strong in space systems, in missiles, in commercial financing and leasing and in visual simulation systems.

In commercial aircraft, too, we continue to possess important strengths. The 96 jetliners that we delivered in 1981, and the 91 airlines operating DC-9s or DC-10s as

of the end of the year, show the extent to which we are a major force in international air transport. The work of developing the DC-9 Super 80, the newest, largest and quietest member of our twin-jet line, was completed in 1981. The aircraft has performed excellently, demonstrating high levels of dispatch reliability and fuel efficiency, with airlines around the world.

Being ready for the future remains one of the key aims of MDC. To that end we are keeping our research and development expenditures at a high level — a total of about \$215 million in 1981. We also invested \$234 million in facilities during the year.

On 29 January 1982 our Board of Directors voted to increase the dividend to 31 cents from 26.5 cents per share quarterly.

Chairman

and Chief Executive Officer

President

5 February 1982

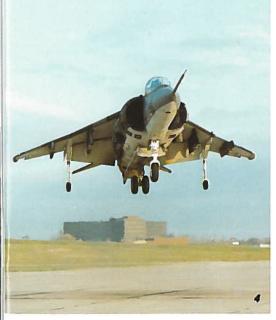




MILITARY AIRCRAFT

MDC began 1981 in a uniquely strong position as a military aircraft producer and ended the year with its strengths enhanced. The F-15, F-18A and AV-8B programs kept us in the forefront of combat aircraft manufacturers. The impressive introduction of the KC-10 Extender and success in new program competitions demonstrated a broadening of our capabilities in the military aircraft area.

F-18A HORNET: In the fourth quarter of 1981, at the end of a fighter selection process as painstaking as any in history, the government of Australia selected the F-18A as its new tactical fighter and attack aircraft. This was the Hornet's second foreign competition and its second success; its selection by Canada in 1980 and now by



Australia is direct testimony to its excellent performance and cost effectiveness. Australia will purchase a total of 75 F-18As, with deliveries beginning in 1984. Final assembly of 73 of these aircraft will be done in Australia.

Work began during the year on the first of 138 CF-18s to be built for Canada. The first delivery to Canada is scheduled for late 1982.

Production go-ahead for U.S. Navy and Marine Corps Hornets was approved in June; the two services are to receive 1,377 of the aircraft. Testing of the F-18A's fighter capabilities was successfully completed at that time, and testing of its attack capabilities is on schedule with completion expected in 1982.

At the end of 1981 MDC had delivered 25 F-18As of which 11 were development aircraft. Hornets completed approximately 3,000 flight hours during the year, bringing the program total to more than 6,000 hours. The U.S. Defense Department's fiscal year 1982 budget includes funds for production of 63 Hornets, and the Administration has included 84 Hornets in its budget request for fiscal 1983.

AV-8B HARRIER II: In the third guarter of 1981 Great Britain and the U.S. Government agreed to the joint development and production of the AV-8B V/STOL (vertical/ short takeoff and landing) aircraft. MDC will be prime contractor. with British Aerospace as principal subcontractor, for 336 AV-8Bs to be built for the Marine Corps; these aircraft will be called Harrier IIs. BAe will be prime contractor and MDC principal subcontractor for 60 AV-8Bs to be called GR5s and assembled in Britain for the Royal Air Force.

It is expected that MDC will produce approximately 75% of AV-8Bs to be sold to countries other than the U.S. and Britain. MDC and BAe plan to cooperate on possible development of supersonic V/STOL aircraft.

The first of four full-scale development Harrier IIs made its first flight in November. The four will be used by the Marine Corps for flight testing at Patuxent River, Maryland.

The federal budget for fiscal year 1982 includes funds for manufacture of 12 pilot production AV-8Bs and long-lead funding for 18 aircraft, production of which will begin in fiscal 1983.

ed by MDC had rolled off the assembly line by the end of 1981. The Air Force was introducing Eagles into air defense squadrons, where they were replacing older, obsolete aircraft in an interceptor role, and F-15s from Langley Air Force Base in Virginia have been assigned to the newly formed Rapid Deployment Force. In late 1982, the Rapid Deployment Force F-15s will start receiving improved bomb racks built by MDC for use in the air-to-ground role.

The first of 86 F-15s to be built in Japan under licensing agreement made its initial flight in the fourth quarter, and MDC's prototype of an enhanced F-15 continued successful flight testing throughout the year. This aircraft's high-resolution radar produces photo-quality images of targets at very long distances. It broadens the aircraft's capacity for night and bad weather operations, enabling it to deliver ordnance without visual clues.

KC-10 EXTENDER: Six KC-10s, military tanker-cargo versions of MDC's DC-10 jetliners, were

- 1. F-18A Hornets.
- 2. KC-10 tanker-cargo aircraft.
- 3. F-15 Eagles in Europe.
- 4. AV-8B Harrier II.

delivered to the U.S. Air Force in 1981. Another six are scheduled for delivery in 1982. The KC-10 became operational with the Strategic Air Command in November at the end of a testing and evaluation period during which it performed impressively in airlift and fighter support missions.

In January 1982 the Air Force ordered four KC-10s for delivery in 1983, and additional purchases are under consideration by Defense officials.

c-x: In August the Air Force selected an MDC design over two other contenders as winner of a long-range cargo aircraft competition. In January 1982 the Air Force announced that it does not plan full-scale development and production of this C-X aircraft at this time.

VTXTS: In the fourth quarter an international team of companies headed by MDC and including British Aerospace as principal subcontractor was selected by the U.S. Navy as winner of the VTXTS jet trainer aircraft and pilot training system competition.

The winning proposal, one of two by the MDC-led team, involved use of a modified version of British Aerospace's Hawk trainer. A contract for pre-full-scale development is expected when Congressional review of the program has been completed, and a Navy decision to proceed with full-scale development at a cost estimated at \$2.2 billion is possible in 1983.

ACES II: In October the Air Force awarded MDC a \$28.1 million contract for 381 ACES II ejection seats for A-10, F-15 and F-16 combat aircraft, with deliveries to begin in April 1982. MDC has already produced more than 2,400 of these escape systems.



COMMERCIAL AIRCRAFT

In 1981, as worldwide economic conditions continued to have a severely adverse impact on demand for wide-cabin jet transport aircraft, orders for new airliners fell 24% below 1980's total. As part of this trend, new orders for MDC's DC-10 jetliners last year were at their lowest level in the history of the program.

New orders for DC-9 twin-jets, by contrast, declined only slightly in 1981 from 1980's level as customers continued to be drawn to the economy, quiet and comparatively small passenger capacity of the new Super 80 version.

DC-10 deliveries declined in 1981, but deliveries of DC-9s were up sharply as aircraft affected by production delays in 1980 became ready for service.

DC-10: Nineteen DC-10s including four Series 10 versions, five Series 15s, eight Series 30s and two Series 40s were delivered to ten airlines in 1981. This compared with 40 deliveries in 1980. The decline is one reflection of the extent to which airline economic problems have been reducing demand for large aircraft since late 1979 and 1980, when orders were placed for the aircraft delivered last year.

Only three orders for DC-10s were received in 1981. In 1980 — a year that was itself adversely affected by the onset of recession — 12 DC-10s were ordered.

The first Series 15 DC-10s, which combine modified Series 10 air-

frames with higher-thrust engines to provide exceptional performance from high-altitude airfields, were delivered during 1981 to Mexicana and Aeromexico.

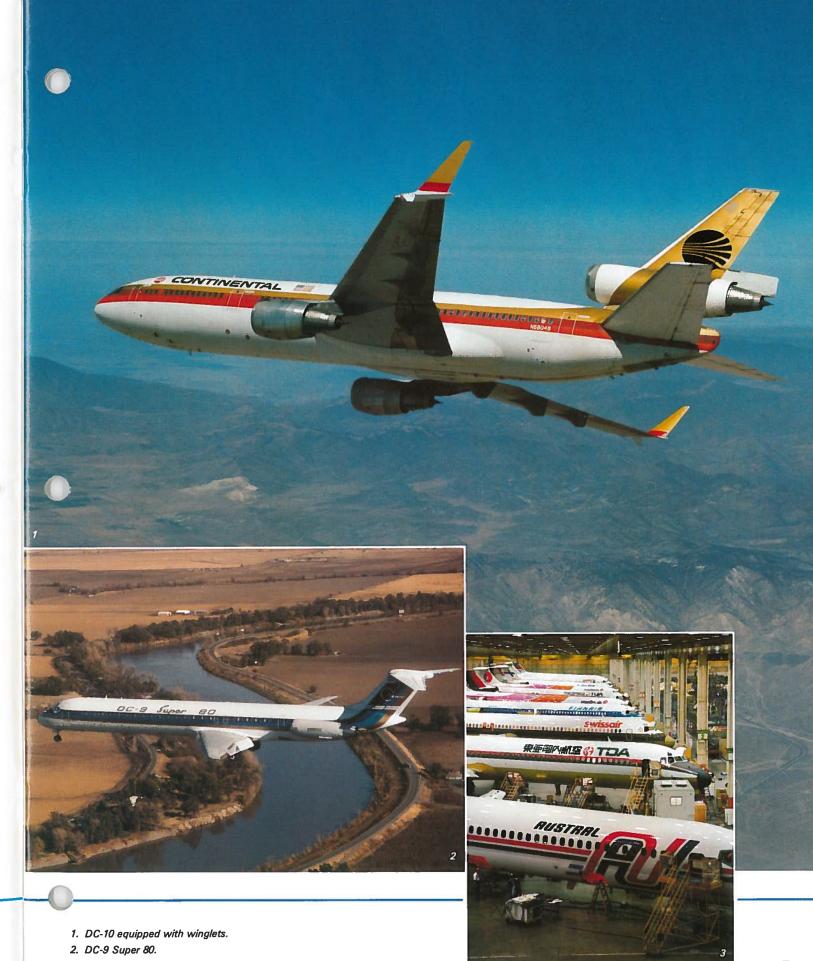
A DC-10 Series 10 leased from Continental Airlines was refitted by MDC for use in a NASA-sponsored program to flight test the aerodynamic effects and fuel savings of winglets of the type shown in the large photo on the opposite page.

Engineering work and market explorations continue on a variety of DC-10 derivatives that could, if produced, increase sales when the financial performance of airlines improves.

As of 31 December 1981, DC-10 program status included nine firm orders, 13 conditional orders and options, and 358 deliveries for a total of 380 aircraft. In addition, firm orders for 12 KC-10 military versions had been received (four more orders were received in January 1982); six of these had been delivered.

DC-9: Seventy-eight DC-9s including 10 Series 30s, five Series 50s, 62 Super 80s and a C-9B military version were delivered in 1981. This compares with 23 deliveries in 1980. The magnitude of the increase resulted from the delivery last year of a large number of DC-9s affected by production delays in 1980.

Our cumulative total of DC-9 orders increased by 17 in 1981. This includes two C-9Bs for the U.S.



3. DC-9 production.

Navy and compares with 20 firm orders in 1980.

In 1981's third quarter a Super 80 became the 1,000th DC-9 delivered since our twin-jet entered service in 1965. This was the first time that a two-engine jetliner program had reached the 1,000aircraft mark.

The Super 80, the largest, quietest and most fuel-efficient member of the DC-9 line, completed one year of airline service in the fourth quarter. In its first year the Super 80 fleet carried more than 3.3 million passengers in more than 40,000 hours of revenue operation and achieved a mechanical dispatch reliability rate — remarkable for a new aircraft — of 99%.

In December the Super 80 became the first DC-9 with an automatic landing system certified by the U.S. Federal Aviation Administration for Category IIIa weather conditions — those in which the pilot cannot see the runway until the airplane is within 50 feet of the ground.

As of 31 December 1981, DC-9 program status included 45 firm orders, 37 conditional orders and options and 1.033 deliveries for a total of 1,115 aircraft.

MDF 100: In the first half of 1981 MDC entered into an agreement with Fokker of the Netherlands under which the two companies began working together to design and explore possible production of a new airliner, designated the MDF 100, in the 150-passenger class. This agreement was terminated in February 1982, but MDC is continuing work on an aircraft of this type and will continue to explore joint venture possibilities with potential partners.





SPACE SYSTEMS AND MISSILES

As 1982 began, MDC's work in the space systems and missiles fields was notable for the wide range of programs it encompassed. In missiles, an increasingly important element of U.S. defense planning, the corporation continues to build a leadership position in the development and application of new technology. And we continue to figure importantly in the space activities of the U.S. and other nations.

HARPOON: The Harpoon anti-ship missile continued throughout 1981 to be a highly successful program. The missile's reliability, with a 97%



success rate for firings of production models, remains at an outstanding level. In an operational test and evaluation program conducted for a major ally of the U.S., Harpoons scored 21 direct hits in 21 firings under a variety of stringent conditions.

The U.S. Navy now has Harpoons on 162 ships and submarines and 78 aircraft. The missiles are deployed also on 69 ships and 10 aircraft of the 12 allied nations that have selected Harpoon for purchase.

A total of 2,587 Harpoon orders had been received as of the end of 1981, compared with 2,178 at the end of 1980. More than 1,950 had been delivered.

DELTA: Our versatile Delta space launch vehicle began its third decade of service in 1981. During the year it made five successful launches, including the first in nearly three years from Vandenberg Air Force Base in California, and produced revenues of \$126 million.

The twelfth major upgrading of Delta capability, the new 3920 version, will become operational in 1982. It will enable Delta to place into earth-synchronous orbit payloads 28 times heavier than those carried by the first Deltas in 1960. This increased capacity will enable Delta to handle the larger satellites planned for the 1980s.

Delta had achieved a success rate of 93% in a total of 158 launches as of the end of 1981. Seven launches are scheduled for 1982.

PAM: MDC's commercially developed Payload Assist Module (PAM), a solid propellant rocket booster, was used as a third stage booster on Delta launches of commercial communications satellites from Cape Canaveral in September

and November. Six Delta/PAM launches are scheduled for 1982. along with two PAM launches from the Space Shuttle.

At year-end, eight commercial users had placed orders totaling \$85 million for 25 PAMs. Fifteen of these are for use with Delta; the others are for Shuttle use. The first launch of the U.S. Air Force's SGS II, which will use a "dual PAM" configuration mounted atop an Atlas launch vehicle to carry military navigation satellites into orbit, is expected in 1982.

CRUISE MISSILE GUIDANCE: In 1981 MDC received authorization from the U.S. Navy to begin production of guidance systems for Tomahawk anti-ship, land attack and groundlaunched cruise missiles. Production has also been authorized for the Common Weapons Control System, a fire control system for shiplaunched and ground-launched Tomahawks.

Missions planning centers developed by MDC are now operational in several locations around the world and are engaged in precise cruise missile route planning.

SPACE SHUTTLE: The huge aft skirts built by MDC for the solid rocket boosters that launched the first Space Shuttle into orbit in April 1981 were later recovered from the Atlantic and returned to our facilities to be readied for re-use. At about the same time work began on a \$36 million second order of three sets of solid rocket booster structures.

Aft propulsion subsystems developed by MDC performed flawlessly on 1981's two Shuttle flights, supplying thrust for initial orbit insertion, orbit adjustments, deorbit, and attitude control both in space and in the early phase of reentry.

- 2. Cruise missile guidance system.
- 3. Delta launch system assembly.

During the year MDC continued work on a \$15 million contract that will lead to production of an environmentally controlled transfer tunnel to be used by scientists moving from the Space Shuttle's crew cabin to the European Space Agency's Spacelab, which is scheduled to be carried into orbit in the Shuttle's cargo bay in 1983.

BALLISTIC MISSILE DEFENSE: In April the U.S. Army elevated MDC from associate to prime contractor in the Ballistic Missile Defense Low Altitude Defense (LoAD) program. LoAD is intended to demonstrate technology for a cost-effective, rapidly deployable, low-altitude system that would defend landbased intercontinental ballistic missiles from attack.

Our contract for research and development work on a preprototype LoAD system was doubled in August to an amount not to exceed \$139.9 million. The Army extended the contract's initial phase through May 1982 and accelerated the program.

The U.S. Army awarded MDC a \$35 million multiyear extension to a Forward Acquisition System (FAS) Integrated Technology Program contract. The program is aimed at solving the technological problems of a system for identifying and tracking missiles attacking the U.S. ICBM force.

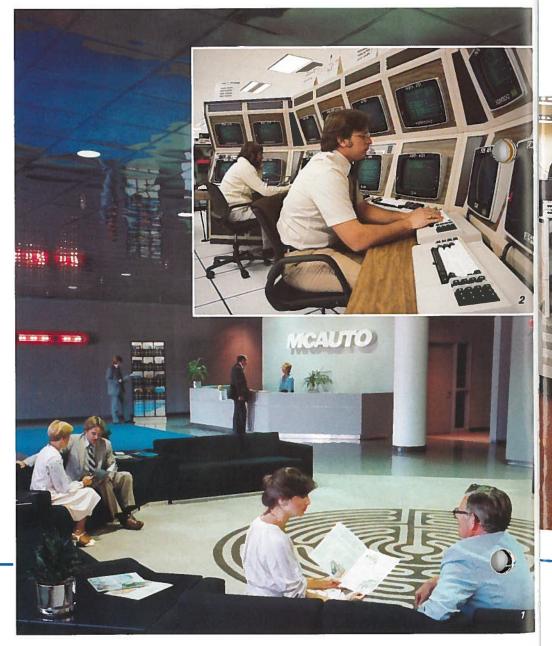
MAST-MOUNTED SIGHT: MDC will design and produce six prototypes of an advanced mast-mounted sight for the Army Helicopter Improvement Program under a \$56.5 million subcontract received in September from Bell Helicopter Textron. This program could lead to the modification of 720 helicopters and a contract value of

10

more than \$1 billion. A unique stabilized platform for the sighting system provides helicopter crews with a sharp, steady battlefield view day or night, through haze or smoke, while minimizing exposure to enemy fire.

LASER COMMUNICATIONS: In July MDC received a \$30.5 million contract for development and testing of a secure, high-capacity laser communications system for space satellites. Additional funding is expected in 1982 and could lead to production work in 1983.

ELECTROPHORESIS: MDC's device for processing pharmaceuticals in space is scheduled to make the first of six research flights aboard the Space Shuttle during the summer of 1982. This electrophoresis device is designed to have, in the zero gravity of space, a greatly enhanced separation capability that could lead to the production of pharmaceuticals not available through earth-based processes. If the research is successful, MDC has a cooperative agreement to produce pharmaceuticals that would be tested and marketed by Johnson & Johnson.





INFORMATION SYSTEMS

DATA PROCESSING SERVICES: The commercial revenues of McDonnell Douglas Automation Company — those from customers outside MDC — totaled \$226 million in 1981. This was a 26% increase over 1980. These results reflect continued success in meeting the computer service needs of business, industry, health care organizations and government.

During 1981 MCAUTO's CAD/ CAM (computer-aided design/ computer-aided manufacturing) or-



ganization undertook a long range planning effort aimed at integrating its offerings and setting priorities. CAD/CAM sales increased dramatically as a result, rising from 23 systems in 1980 to 67 in 1981. In October two important new products were introduced: the Unigraphics ADS-100, a lowpriced, fully capable single station system, and the DDS-100 graphics work station. Both have been well received and are expected to further improve our position in the explosively expanding CAD/CAM market.

The MCAUTO international division's business, though still small, was twice as large in 1981 as in 1980. Unigraphics CAD/CAM systems accounted for more than half of the division's sales, and fees for consulting and engineering services were also significant. In the second quarter MCAUTO acquired the engineering services division of BOC/Datasolve of Great Britain; this made possible direct sales to the United Kingdom's engineering market.

Two divisions of Bradford National Corporation were acquired in December and became a new subsidiary, MCAUTO Systems Group, Inc., which specializes in processing Medicaid insurance claims and has substantial systems development contracts with the U.S. Government, state and local governments, and private industry. MCAUTO also acquired the assets of Improved System Technologies (IST), a leader in teaching structured systems analysis, design and programming techniques. Acquisitions of this kind — including some currently being negotiated — are expressions of a commitment to broaden MCAUTO's

product line in the computer services area.

In March the company formally opened its new \$70 million St. Louis campus, which centralizes many previously scattered functions and contains what is believed to be the largest concentration of computer power in the world.

MCAUTO added more than 100 hospitals to its client base during 1981, and on 31 December its Health Services Division (HSD) was serving 1,254 hospitals, clinics and health care organizations in 46 states. HSD's revenues in 1981 were 26% above those for the previous year, and were more than \$100 million for the first time. At year-end 595 hospitals were using HSD's financial control products, and 66 were using its data collection and patient care systems. Seventy-eight medical groups were using its physician billing system, and 851 hospitals and health care organizations were using its medical records abstracting system.

Major enhancements to several of MCAUTO's health care data processing products were announced during 1981, strengthening the company's leadership in this field. MCAUTO continued throughout the year to market its health care products in Canada, Australia, the United Kingdom, Argentina and the Mideast.

At year-end MCAUTO had computers and other data processing equipment with an acquisition value of \$411 million at its St. Louis and West Coast facilities, and the company employed 5,888 personnel.

DATA PROCESSING SYSTEMS: A new generation of products introduced

- 1. Lobby of MCAUTO's new world headquarters.
- 2. MCAUTO systems in operation.
- 3. Microdata equipment production.

in 1981 will enable Microdata Corporation, a wholly-owned MDC subsidiary which designs and manufactures data processing systems, to enter new markets and strengthen its position in markets it was already serving.

In the third quarter Microdata introduced the SEOUELTM large business system, which is expected to open new markets not accessible to the company's highly successful REALITY series of small business systems. The easy-to-use SEQUEL system is compatible with REALITY but offers greatly increased computing power and storage capacity. It features a highspeed 32-bit central processor, up to two megabytes of main memory and a billion bytes of disk memory, and power sufficient for up to 127 interactive terminals.

Also in the third quarter, the company announced an Application Language Liberator — ALL^{TM} — as an option available with SEQUEL. A general purpose application software generator, the ALL package offers a significant advance in programmerless software technology and makes it possible to develop customized applications in record time.

The WORDMATE™ word processing system, introduced in October, uses a multipurpose computer terminal. It does both word and data processing and offers superior information storage, processing speeds and versatility, and it is being offered to current and future REALITY and SEQUEL users as an economical alternative to standalone word processors. Users of REALITY and SEQUEL can incorporate the WORDMATE package into their systems.



COMMERCIAL FINANCING AND LEASING

McDonnell Douglas Finance Corporation's earnings totaled \$13.4 million in 1981, compared with \$15.3 million the previous year. The decline resulted from 1981's environment of very high interest rates, which caused the average effective interest rate on MDFC's debt to rise from 11.9% in 1980 to 14.6% in 1981. Total volume of financing activity was \$273.7 million, compared with \$124.1 million in 1980. Business outside the commercial aircraft field was 45% of 1981's total volume and increased by 28% over 1980.

MDFC had \$335.3 million of receivables and leased equipment other than MDC aircraft as of 31 December. This was 47% of the total portfolio. The comparable amount a year earlier was \$249.4 million — 46% of the total.

Equipment leased by MDFC included, at the end of 1981, MDC aircraft carried at \$250 million. Other major equipment categories were railroad rolling stock of \$42 million; computer mainframes, \$40 million; trucks and other highway vehicles, \$38 million; computer peripherals and auxiliary equipment, \$30 million; specialized equipment, \$26 million; shipping containers, \$23 million; and non-MDC aircraft, \$16 million. Other equipment on lease was carried at \$52 million.

MDFC's total portfolio was \$708.8 million on 31 December and included, in addition to notes and other









receivables, \$516.8 million in leased equipment. The comparable figures at the end of 1980 were \$545.9 million and \$360.2 million.

A separate MDFC annual report is available upon request. A condensed financial report on MDFC is presented in Note E on page 25.



OTHER DIVERSIFICATION

SOLAR ENERGY: Solar One, a 10,000-kilowatt solar power plant designed by MDC for the U.S. Department of Energy and Southern California Edison Company, was undergoing final preparations for its first operational tests as 1981 ended. Situated in the Mojave Desert, Solar One is the world's largest solar facility, using 1,818 heliostats (large movable mirrors) to track the sun and focus its reflected energy on a tower-mounted central receiver.

FUSION ENERGY: Work proceeded throughout 1981 on an experimental fusion energy facility to be designed, built and operated by MDC at Oak Ridge National Laboratory in Tennessee. Approval to begin construction of the facility, which will test the feasibility of a fusion concept called Elmo Bumpy Torus, is possible in 1982. This will

be the first experiment of its kind to be managed by private industry outside a government laboratory.

MDC remains a supplier of various high-technology components for other nuclear fusion experiments.

Canadian order for two VITAL visual display systems to be used in CF-18 Hornet simulators, and additional VITAL sales for F-16 simulators, expanded MDC's leadership in the field of visual simulation systems for pilot training during 1981. New airline customers for VITAL included Aeromexico, Korean Airlines and Ozark Airlines. More than 150 VITAL units are now in use at 50 locations around the world. Total VITAL revenues in 1981 were \$22.3 million.

LABORATORY AUTOMATION: During the year MDC's VITEK subsidiary increased by 38% the number of AutoMicrobic Systems (AMS™) in use by medical laboratories. Sales of the test kits used with AMS were 55% higher in 1981 than in 1980. AMS automates the identification of pathogens and appropriate antibiotics. As an adjunct to AMS, a data center was introduced to automate epidemiology information. At least four new types of test kits are expected to be introduced in 1982.

- 1. Heliostats and receiving tower at Solar One plant.
- 2. VITEK test kits.
- 3. Newest VITAL visual simulation system.





MDC IS PEOPLE

In southern California, men and women of MDC devote their free time to visiting junior high schools, encouraging young people to continue their education.

In Brevard County, Fla., when officials were faced with an almost impossibly tight deadline in trying to print and mail real estate value notices, volunteers from MDC appeared on the scene and got the job done.

MDC teletype operators donate their time and skills to help the deaf communicate with distant friends over teletype-telephone connections. The examples go on and on: MDC people serve as leaders of Scout troops, as Big Brothers and Big Sisters, as counselors to Junior Achievement groups.

Cumulatively, these volunteer efforts add up to an incalculably vast contribution to communities across North America and in many other parts of the world.

In 1981, MDC personnel received \$2,025.4 million in wages and salaries. They donated \$4.1 million through the corporation's personnel charity plans to 102 United Way organizations and other good causes. In addition the McDonnell Douglas Foundation made charitable contributions of \$4.3 million.

In their fifth annual Operation Helping Hand, MDC personnel in St. Louis donated approximately 7,000 pounds of food to the Food Crisis Network for the assistance of needy families. Affirmative Action Program Task Force volunteers supported this effort.

MDC continued to support the Youth Motivation Program, which exposes young people to opportunities in industry and helps them set and achieve goals. The company also donated usable surplus equipment to workshops for handicapped people, churches, technical schools, colleges, universities, and other non-profit organizations.

In 1981, MDC awarded 8,281 contracts worth \$29.2 million to businesses owned and operated by minorities or women or employing handicapped persons. MDC formalized a longstanding policy when it signed an agreement under which it will seek minority suppliers to participate in the U.S. Small Business Administration's Capital Development Plan.

MDC continued to support organizations working to enhance the employment capabilities of minorities and women. The company participated in programs designed to encourage members of minorities, women and handicapped persons and match them with employment opportunities.

Each year, the corporation develops Affirmative Action Plans for its major components. Included in these plans are hiring and promotion goals for minorities and women. In 1981 MDC met or exceeded these goals.

The company also developed 1981 Affirmative Action Plans for recruiting, employing, and advancing handicapped individuals, and made extensive physical renovations to accommodate handicapped individuals at all facilities.

MDC hired 1,686 military veterans in 1981.

The Develop Engineering Students Program, a work-study program to













encourage talented high school students to enter the field of engineering, had 52 students enrolled in 1981. Twelve students who completed this program in 1981 are now in college and are candidates for the company's four-year Cooperative Education Program, which currently has 393 participants enrolled at 33 colleges and universities.

In 1981, MDC expanded its Personnel Development Program by adding a Leadership Skills Workshop. The number of Quality Circles — small groups of people who meet to discuss work problems, investigate causes, and recommend solutions — was increased. At the end of the year, 1,284 employes were involved in 146 Quality Circles.

During 1981, 6,698 employes enrolled in classes under the company-sponsored Voluntary Improvement Program, and 32,492 completed various company-time training courses.

The Employe Assistance Program, established in March 1970, continues to help employes and dependents with problems such as alcoholism and drug abuse. From 1970 through the end of 1981, 6,781 employes and 973 dependents across the country had sought assistance and been referred to community resources.

Through the MDC Scholarships Program, 129 sons and daughters of MDC personnel received a total of \$181,706 in grants for four-year college programs in 1981.

During 1981, MDC employes donated 12,929 units of blood to the American Red Cross.

Cash awards presented in the company's cost-saving Employe Sugges-

tion Program exceeded \$700,000 in 1981. Suggestions saved MDC more than \$7.1 million.

The MDC Ridesharing and Commuter Computer Programs have continued to grow, serving increasing numbers of employes and augmenting the company's energy conservation efforts. In a survey conducted by a national vanpooling association, MDC was ranked as having the tenth largest company-sponsored program in the nation. The Insurance Company of North America (INA) selected MDC for a Safety Achievement Award in recognition of the corporation's vanpool safety record.

More than 19,700 employes participated in nearly 100 companysponsored sports, recreation and educational enrichment activities and organizations in 1981.

Management-union negotiations resulted during 1981 in 31 agreements with 12 unions. The agreements are for 36-month periods and cover approximately 32,000 personnel.

In 1981, 3,232 men and women retired. A total of 31,172 persons is now receiving MDC retirement benefits. Pension payments to retirees totaled \$84.8 million in 1981. The company paid \$165.4 million in medical and health care expenses and disability income for eligible recipients, and \$13.2 million in death benefits during the year.

MDC paid \$816.2 million (including \$129.7 million in taxes for government retirement and unemployment programs) for benefits which included voluntary savings programs and layoff benefits; vacation, holiday, and sick leave pay; military reserve duty, bereavement and jury duty pay.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of MDC's financial condition and results of operations should be read in conjunction with the consolidated financial statements, particularly the analyses by segment presented in Note B.

FINANCIAL CONDITION

MDC's capitalization at the end of 1981 totaled \$1,992 million and was composed of \$1,654 million in shareholders' equity and \$338 million in long and short-term debt. There were no existing commitments for capital expenditures which would require additional long-term capital, either debt or equity.

At the beginning of 1979, MDC had \$588 million in cash and short-term investments and no short-term debt. At the end of the three-year period, MDC's 1981 sales had increased by \$3.25 billion, or 79%. This large increase in sales required substantial investments in the business, total assets increasing by \$1.27 billion, or 41%. This was financed by a combination of reductions in cash balances and increases in short-term debt of \$817 million, with the remainder being financed by funds generated by the business.

During 1981, cash and short-term borrowings were essentially unchanged as funds generated from operations were adequate to provide for the increased investments in the business, including over \$150 million in financing assistance to airline customers directly by MDC and an additional \$75 million indirectly through MDFC.

MDC's liquidity position for expected future needs is considered to be satisfactory. To meet near term needs, MDC is maintaining \$550 million in open credit lines, of which \$306 million was available at 31 December 1981, and MDC believes it has additional borrowing capacity, if needed.

RESULTS OF OPERATIONS

Sales and other income increased 21% in 1981 and 14% in 1980. Earnings from operations recovered in 1981 from the depressed level of 1980 to a moderately higher level than 1979. The commercial aircraft segment's loss in 1981 included a \$50 million provision for probable restructuring or default of commercial aircraft financing transactions, while its 1980 operations were also adversely impacted, principally from

costs associated with the introduction of the DC-9 Super 80.

Net earnings for 1981 improved from 1980, but were lower than 1979. Despite the improvement from 1979 in earnings from operations, lower net earnings in 1981 resulted from the change from investing free cash in 1979 to borrowings at higher interest rates in 1981, as discussed above.

Military Aircraft. Sales and other income of the military aircraft segment increased 35% in 1981 and 16% in 1980, principally from the F-15 Eagle, F-18A Hornet, and KC-10 Extender programs and, to a lesser extent, the AV-8B Harrier program. It is expected that these revenues will show further, substantial increases in 1982.

Earnings from operations increased 34% in 1981 after declining 15% in 1980 due to additional cost provisions on the KC-10 program. The lower overall margins in this segment are continuing largely because of significantly below average results on the F-18A and KC-10 programs.

Also during 1981, MDC expended substantial research and development funds in competition for the C-X transport program and the VTXTS trainer program.

Commercial Aircraft. Sales and other income increased about 9% in 1981 and 13% in 1980. During 1981, deliveries of DC-9 aircraft increased from 23 to 72 (excluding leased aircraft) while DC-10 deliveries decreased from 40 to 19. Deliveries of both the DC-9 and DC-10 are expected to decline substantially in 1982.

Losses from operations in 1981 were significantly increased by a \$50 million provision for probable restructuring or default of commercial aircraft financing transactions, while operations in 1980 were even more severely impacted by costs associated with the introduction of the DC-9 Super 80.

During 1981, the DC-9 program's productivity improved greatly although the margins on the aircraft delivered were low because of the high production costs incurred in 1980 and early 1981. The DC-10 program's productivity was good despite the lower production rate. All remaining deferred production costs of the DC-10 program were absorbed in 1981 and at 31 December 1981 the program-average costing rates resulted in a significant over-absorption of the production costs of delivered aircraft, in anticipation of

the higher unit costs expected in the future due to lower production rates.

The current inability of airlines to take timely delivery of aircraft built to order, plus the decline in the quantity of firm orders for aircraft, has resulted in MDC holding significantly more "at-risk" inventory than in the two prior years, and increased the financing costs of MDC.

MDC expects that the abnormal economic conditions of the airline industry will improve and that, when the financial condition of the airlines stabilizes, MDC commercial aircraft (models being currently produced and those planned for development) will be competitive in price and capability and will secure substantial sales in a large market. However, there appears little prospect of a near-term improvement in this segment, and if orders for currently-produced or derivative aircraft do not materialize as expected, material losses on the disposal of excess inventories would occur.

Space Systems and Missiles. Sales and other income increased 14% in 1981 and 5% in 1980, principally from the Delta, Shuttle, and Ballistic Missile Defense programs. The increase in earnings from operations was the result of increased volumes and lower development expenditures.

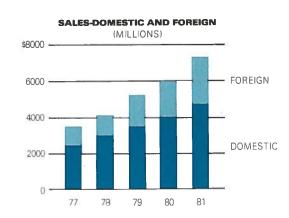
Other Industries. Sales and other income increased 20% in 1981 and 49% in 1980, the larger increase in 1980 partially attributable to the acquisition of Microdata in late 1979. Earnings from operations increased in 1981, principally from the MCAUTO operations. Microdata and VITEK experienced losses in 1981 in about the same amounts as in 1980.

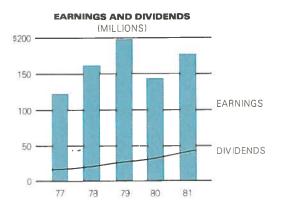
Non-Operating Income and Expense. The unconsolidated finance subsidiary, MDFC, had slightly lower earnings in 1981 than in either 1980 or 1979, largely due to the higher interest rates paid on borrowed funds.

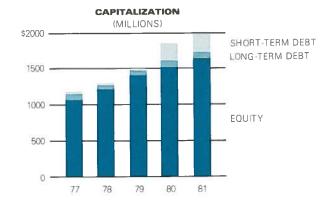
Non-operating income was approximately the same in 1981 as in 1980, after excluding the 1980 real estate and investment gains, but significantly less than 1979 because of the interest earned from the investment of free cash. Interest expense was \$69.8 million in 1981 as compared to \$11.7 million in 1980 and \$10.8 million in 1979.

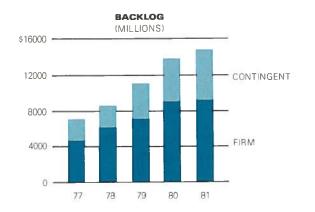
INFLATION

Reference is made to the supplementary data on page 29 for the presentation of certain financial data restated to measure inflation and discussion of the effects of inflation on MDC.









CONSOLIDATED BALANCE SHEET

	ASSETS		
	31 December	1981	1980
	Dollar amounts in millions		
Current	Cash including time deposits	\$ 15.4	\$ 11.4
Assets	Accounts and notes receivable, Notes C and G:		
	U.S. Government	273.3	227.6
	Commercial	204.8	194.8
	Recoverable income taxes	23.0	59.9
		501.1	482.3
	Contracts in process and inventories, Notes C and D:		
	Government contracts in process	1,696.2	1,339.8
	Commercial products in process	1,364.4	1,754.1
	Materials and spare parts	971.2	770.4
	Progress payments to subcontractors	541.4	409.3
	Less applicable progress payments	(2,084.8)	(1,857.9
		2,488.4	2,415.7
	Prepaid expenses	9.3	10.4
	Total Current Assets	3,014.2	2,919.8
acilities	Land	50.2	32.3
	Buildings and fixtures	509.2	472.7
	Machinery and equipment	922.0	777.3
	Less accumulated depreciation	(754.0)	(658.4
		727.4	623.9
ther	Investment in and advances to MDFC, Note E	324.3	218.2
ssets	Rental equipment and parts	103.7	29.9
	Deferred charges	40.4	40.6
	Other	154.2	67.4
		622.6	356.1

See accompanying notes to consolidated financial statements

	31 December Dollar amounts in millions	1981	1980
Current Liabilities	Notes payable to banks, Note F	\$ 244.0	\$ 241.3
Liabilities	Accounts and drafts payable	612.2	597.6
	Accrued expenses	118.3	114.3
	Employe compensation	164.6	181.6
	Income taxes, principally deferred, Note G	614.1	597.8
	Progress payments received	162.6	169.4
	Estimated modification, completion, and other contract adjustments	700.7	401.6
	Current maturities of long-term debt	22.9	7.8
	Total Current Liabilities	2,639.4	2,311.4
	Total Guitant Liabinties	2,003.1	2,011.
Long-Term	43/4 % Convertible subordinated debentures	32.7	47.2
Debt	Other	38.6	28.7
	Note H	71.3	75.9
Shareholders'	Preferred Stock, \$1.00 par value:		
Equity	Shares authorized: 10,000,000		
	Shares issued: None		
	Common Stock, \$1.00 par value, Notes I and J:		
	Shares authorized: 60,000,000		
	Shares issued: 39,333,898	39.3	39.3
	Capital in excess of par value	360.0	346.7
	Earnings retained for growth	1,276.5	1,141.1
	Translation of foreign currency statements	(3.2)	
	Less cost of treasury shares:		
	1981, 820,028 shares; 1980, 1,037,436 shares	(19.1)	(14.6
		1,653.5	1,512.5
Commitments and Contingencies	Notes L, M and N		
	Total Liabilities and Shareholders' Equity	\$4,364.2	\$3,899.8

CONSOLIDATED STATEMENT OF SHAREHOLDERS' EQUITY

	Dollar amounts in millions			
	Dollar amounts in millions			
ommon	Beginning balance	\$ 39.3	\$ 38.7	\$ 38.6
tock	Stock options exercised - 1980, 219,896 shares; 1979, 174,616 shares		.2	.1
	Conversion of debentures - 389,358 shares issued		.4	
		39.3	39.3	38.7
apital in	Beginning balance	346.7	325.8	318.8
xcess Of ar Value	Stock options exercised	3.1	6.7	4.0
ai vaiue	Conversion of debentures	7.7	11.6	
	Incentive compensation awards paid	2.5	2.6	3.0
		360.0	346.7	325.8
arnings	Beginning balance	1,141.1	1,030.9	859.9
etained or Growth	Net earnings	176.6	144.6	199.1
or Growth	Cash dividends declared	(41.2)	(34.4)	(28.1
		1,276.5	1,141.1	1,030.9
ranslation	Cumulative balance at 1 January 1981	.2		
f Foreign Currency	Effect of fluctuations in foreign exchange rates	(3.4)		
tatements		(3.2)		
reasury	Beginning balance	(14.6)	(17.2)	(17.5
nares	Purchased - 1981, 526,524 shares;	(45.2)		/2 1
	1979, 78,200 shares Conversion of debentures - 1981, 472,486	(15.3)		(2.1
	shares; 1980, 6,330 shares	6.8	.1	
	Stock options exercised - 1981, 174,562 shares; 1980, 38,530 shares	2.6	.6	
	Incentive compensation awards - 1981, 96,884 shares; 1980, 137,281 shares; and 1979, 183,624			
	shares	1.4	1.9	2.4
		(19.1)	(14.6)	(17.2
	Shareholders' Equity	<u>\$1,653.5</u>	\$1,512.5	\$1,378.2

See accompanying notes to consolidated financial statements

CONSOLIDATED STATEMENT OF CHANGES IN FINANCIAL POSITION

	Years Ended 31 December	1981	1980	1979
	Dollar amounts in millions			
Source of	From operations:	\$ 176.6	\$ 144.6	\$ 199.1
Funds	Net earnings	(13.4)	(1.3)	(2.3)
	Earnings retained by MDFC	141.8	99.6	77.0
	Depreciation of facilities and rental equipment	3.9	4.5	5.4
	Stock issued to employes Other	6.6	4.1	3.6
	Other	315.5	251.5	282.8
		313.3	231.3	202.0
	Facilities sold or retired	8.2	1.5	.5
	Advances repaid by MDFC		15.9	
	Rental equipment and parts sold or retired	7.5	11.0	40.7
	Long-term notes payable	64.6	31.3	18.1
	Proceeds of stock options exercised by employes	5.7	7.5	4.1
	Miscellaneous		<u></u>	1.8
		401.5	318.7	348.0
Use of Funds	Acquisition cost of acquired companies excluding acquired working capital of \$2.0 in 1981 and			
	\$7.0 in 1979	.4		66.0
	Facilities acquired	233.8	267.4	157.2
	Advances to MDFC	92.7		65.5
	Rental equipment and parts	100.1	16.2	4.9
	Increase in other investments	58.3	15.5	6.6
	Long-term borrowings	54.7	30.1	9.8
	Cash dividends declared	41.2	34.4	28.1
	Treasury shares purchased	15.3		2.1
	Miscellaneous	38.6	11.8	
		635.1	375.4	340.2
	Increase (Decrease) in Working Capital	<u>\$(233.6)</u>	\$ (56.7)	\$ 7.8
Analysis of	Cash including time deposits	\$ 4.0	\$(281.5)	\$ (16.0
Changes in Working Capital	Short-term investments		(34.3)	(245.1
Working Capital	Current receivables	18.8	86.4	87.8
	Contracts in process and inventories,			
	net of progress payments	79.5	541.7	395.9
	Prepaid expenses	(1.1)	(.3)	(17.2
	Short-term borrowings	(17.8)	(242.0)	(2.8
	Other current liabilities	(317.0)	(126.7)	(194.8
	Increase (Decrease) in Working Capital	<u>\$(233.6)</u>	\$ (56.7)	\$ 7.8
	See accompanying notes to consolidated financial statem	nents		

See accompanying notes to consolidated financial statements

CONSOLIDATED STATEMENT OF EARNINGS

	Years Ended 31 December Dollar amounts in millions, except share data	1981	1980	1979
	Donar amounts in militoris, except share auta			
Income	Sales, Note O	\$7,384.9	\$6,066.3	\$5,278.5
	Other income	116.4	131.7	147.3
		7,501.3	6,198.0	5,425.8
Costs and	Cost of products and services	6,296.4	5,240.9	4,435.3
Expenses	Research and development	215.7	199.0	194.0
	Administrative and general	687.6	588.7	475.2
	Interest and debt expense	69.8	11.7	10.8
	Income taxes, Note G	55.2	13.1	111.4
		7,324.7	6,053.4	5,226.7
Earnings	Net earnings	\$ 176.6	\$ 144.6	\$ 199.1
	Earnings per share	\$4.44	\$3.65	\$5.06
	Can accommonwing notes to consolidated financia	-1 -1-1		

See accompanying notes to consolidated financial statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

31 December 1981

Dollar amounts in millions, except share data

A. Summary of Accounting Policies

Principles of Consolidation. The consolidated financial statements include the accounts of McDonnell Douglas Corporation (MDC) and all of its significant subsidiaries except McDonnell Douglas Finance Corporation (MDFC), which is accounted for on the equity basis. In consolidation significant intercompany items and transactions are eliminated.

Microdata Corporation, which manufactures and sells data processing equipment in the United States and in foreign countries, was acquired for \$73.0 million cash, including expenses, and its accounts included in the consolidated financial statements effective 1 October 1979.

Long-Term Notes Receivable. Long-term notes receivable, acquired by MDC primarily from sales of commercial aircraft, are recorded at their fair market value. Most notes are transferred to MDFC or its export finance subsidiary at that value.

Long-Term Contracts. In accordance with industry practice, long-term Government contracts and commercial aircraft programs are classified as current assets or liabilities in the balance sheet, even though a substantial portion is not expected to be realized within one year.

Adjustments of costs and earnings may be made during and after completion of such long-term contracts; therefore, earnings recorded in the current year may include adjustments applicable to sales recorded in prior years.

Government Contracts. Government contracts are primarily accounted for on a percentage-of-completion method wherein sales are recorded at their estimated contract price as the work is performed. Under this method, all costs (including general and administrative expenses) are charged to Costs and Expenses as incurred and the recorded sales values (equal to incurred costs plus estimated earnings) are carried in the account, Government contracts in process. At the time the item is completed and accepted by the customer, the sales value of the item is transferred to Accounts receivable - U.S. Government.

Certain contracts contain incentive provisions which provide increased or decreased earnings based upon performance in relation to established targets. Incentives based upon cost performance are recorded currently and other incentives are recorded when the amounts can reasonably be determined.

Title to certain items, included in the captions of Materials and Progress payments to subcontractors, is vested in the U.S. Government by reason of progress payment provisions of related contracts.

Commercial Programs. Commercial products in process (including military versions of commercial aircraft) are stated on the basis of production and tooling costs incurred less cost allocated to delivered items, reduced (where applicable) to realizable market after giving effect to the estimated costs of completion.

Cost of sales for commercial and military DC-9 aircraft and the initial production of the KC-10 tanker-cargo version of the DC-10 is determined on a specific-unit cost method. Cost of sales of the DC-10 aircraft program, including follow-on KC-10 aircraft, is determined on a program-average cost method. Inasmuch as the DC-10 program involves several models with differing sales prices and costs and the contracts contain escalation clauses based upon the future cost of materials and labor, the cost of sales for a particular aircraft is computed at the percentage of the sales price that the total of the estimated tooling and production costs for the entire program bears to the total estimated sales price for all aircraft in the program.

Materials and spare parts are stated at the lower of cost (priced generally on a moving average method) or market.

Foreign Currency Translation. MDC elected to adopt, as of 1 January 1981, the Statement of Financial Accounting Standards No. 52 which revises certain translation measurements and requires that financial statements be first prepared in the functional currency in which the entity operates. Where these functional currency statements must be translated to U.S. dollars for consolidation, the translation adjustment resulting from the fluctuation in the exchange rate for that currency from the previous year is carried directly to shareholders' equity under a separate caption. As the U.S. dollar is deemed to be the functional currency of MDC's principal foreign operations (e.g. manufacture in Canada of DC-9 and DC-10 wing sets and training of foreign personnel under dollar-denominated contracts), such operations do not give rise to translation adjustments upon consolidation.

Income Taxes. United States and foreign income taxes are computed at current tax rates on reported earnings, less investment and other tax credits. Adjustments to such tax computations are made currently for all items whose income tax treatment creates a permanent difference between taxable income and reported income, but are not made for items that create only timing differences between fiscal periods.

The investment tax credits arising from commercial aircraft tooling are recorded as reductions of income tax provisions as the tooling is amortized; investment tax credits

from leased aircraft are recorded over the related lease periods; and all other credits are recorded in the current period.

The undistributed earnings of foreign subsidiaries are considered to be permanently invested; accordingly, no provisions are made for taxes which would become payable upon the distribution of such earnings as a dividend to MDC. To the extent that DISC (Domestic International Sales Corporation, as defined in Section 992 of the Internal Revenue Code) income is expected to be reinvested and remain tax exempt, no provisions for income taxes thereon are made. MDC files a consolidated return for federal and certain state income taxes, and dividends from subsidiaries included therein are not subject to income tax.

Facilities. Facilities are carried at cost and depreciated over the useful lives of the various classes of properties, using primarily accelerated methods.

Stock Options. At the time options are exercised, the difference between the proceeds and either (i) the par value of previously unissued stock or (ii) the average cost of treasury stock is charged or credited to Capital in excess of par value. There are no charges or credits to earnings from the exercise of options.

Earnings Per Share. Earnings per share computations are based upon (i) the weighted average of common stock and common stock equivalents outstanding during the period and (ii) net earnings after adjustment for interest and debt expense on the common stock equivalents less applicable income taxes. Common stock equivalents include the shares reserved for conversion of the 43/4 % Convertible Subordinated Debentures and the net increase in shares from exercise of stock options, assuming all dilutive options had been exercised and the proceeds used to purchase other shares. For primary earnings per share, purchases of shares with option proceeds were assumed to have been made at the average market price and, for fully-diluted earnings per share, at the higher of the year-end or average market price; however, both primary and fully-diluted computations have resulted in the same earnings per share.

B. Segment Financial Data

Financial data related to military aircraft, commercial aircraft, space systems and missiles, and all other industry segments are shown below. These data were developed by classifying each division and subsidiary according to its principal products (except for allocations necessary to segregate military and commercial aircraft operations) and combining related operations into industry segments; consequently the segment data include immaterial amounts related to other products and services. Intersegment transfers were immaterial and principally made at cost. Sales and other income, earnings and assets of these segments are reconciled to the consolidated financial statements amounts in the following tables.

YEARS ENDED 31 DECEMBER	1981	1980	1979
Sales and other income			
Military aircraft	\$3,679.5	\$2,728.2	\$2,349.5
Commercial aircraft	2,424.0	2,231.4	1,968.3
Space systems and missiles	952.9	834.5	791.9
Other industries	397.4	330.7	222.0
Operating income	7,453.8	6,124.8	5,331.7
Net earnings of MDFC	13.4	15.3	14.3
Non-operating income	34.1	57.9	79.8
	\$7,501.3	\$6,198.0	\$5,425.8
Earnings			
Military aircraft	\$ 265.1	\$ 197.8	\$ 232.1
Commercial aircraft	(85.0)	(144.3)	(55.6)
Space systems and missiles	62.5	49.0	54.8
Other industries	17.1	(1.4)	7.0
Earnings from operations	259.7	101.1	238.3
Net earnings of MDFC	13.4	15.3	14.3
Non-operating income	20.2	20.0	
and expenses	33.5	56.9	72.1
General corporate expenses	(5.0)	(3.9)	(3.4)
Interest and debt expense	(69.8)	(11.7)	(10.8)
Income taxes	(55.2)	(13.1)	(111.4)
	\$ 176.6	\$ 144.6	\$ 199.1
Assets			
Military aircraft	\$2,601.9	\$1,833.7	\$1,402.1
Commercial aircraft	2,225.1	2,411.0	2,055.1
Space systems and missiles	692.1	695.6	503.8
Other industries	492.1	452.9	366.5
Assets used in operations	6,011.2	5,393.2	4,327.5
Less applicable progress			
payments	(2,084.8)	(1,857.9)	(1,573.0)
Investment in and advances			
to MDFC	324.3	218.2	232.8
Corporate assets, principally cash and short-term			
investments in 1979	113.5	146.3	393.3
nivestments in 1777			
	\$4,364.2	\$3,899.8	\$3,380.6
Depreciation and amortization			
Military aircraft	\$ 33.8	\$ 22.9	\$ 16.7
Commercial aircraft	32.7	20.8	21.7
Space systems and missiles	16.2	12.5	9.2
Other industries		46.5	29.8
Other industries	61.4	40.5	
	61.4	40.3	
Facilities acquired		\$ 73.6	\$ 32.6
	\$ 85.6	\$ 73.6	\$ 32.6
Facilities acquired Military aircraft			

The military aircraft segment's products include the design, development and production of attack and fighter aircraft, and transport aircraft (including military versions of the DC-series). The attack and fighter aircraft cover a full spectrum of missions (air superiority, close-support, reconnaissance, electronic countermeasures, etc.) and include land-based and aircraft-carrier based versions and the latest in vertical-takeoff-and-landing technology. The commercial aircraft segment's products were primarily

DC-series transport aircraft, spare parts and related services, sold to airline customers worldwide. The space systems and missiles segment's products include advanced studies and development and production of satellite launching vehicles, space shuttle components and payloads, laser communications, space manufacturing processes, ballistic missile defense systems and tactical and strategic missiles. The caption, Other industries, presents non-reportable segments which are engaged in computer sales and services, electronics, and other industries.

All segments made sales to U.S. Government agencies (including sales to foreign governments through foreign military sales contracts with U.S. Government agencies), amounting to approximately \$4,362.4 million in 1981, \$3,409.9 million in 1980 and \$3,002.0 million in 1979. No other single customer accounted for 10% or more of consolidated revenues in 1981, 1980 or 1979.

C. Government Contracts

Contractual authority to supply additional items, or to change the work scope of a contract, prior to reaching final agreement on price is a frequent and normal occurrence in procurements by the U.S. Government, as the contracts contain standard provisions for assuring that the contractor will receive an equitable price in the unusual event a mutually satisfactory price cannot be subsequently negotiated with the Contracting Officer.

Included in Accounts receivable was \$67.9 million at 31 December 1981 and \$77.5 million at 31 December 1980 representing the estimated sales price for items delivered and other work performed, which was not billable because the negotiated price information or documents necessary to invoice under the contract had not been received. Approximately \$16.8 million of the 1981 amount is expected to be collected after one year. In addition, a material portion of the Government contracts in process account similarly represented work performed before the pricing, negotiation and contract documentation cycle had been completed, but the aggregate amount thereof was not identifiable as such in the accounting records.

No material amounts were included in Receivables or Government contracts in process representing retainage or for which appropriated funds were not available or the item was otherwise in controversy, other than in respect to normal price negotiations.

D. Commercial Products in Process

On 31 December 1981, the backlog of firm orders for undelivered commercial transport aircraft was 9 DC-10s and 43 DC-9s, compared with 25 DC-10s and 105 DC-9s a year earlier. Of these orders, 9 DC-10s and 32 DC-9s are scheduled for delivery in 1982 and the balance of DC-9s during the first half of 1983.

Due to the financial inability of an airline customer to take delivery, at 31 December 1981 the account included the cost of nine DC-9 Super 80 aircraft, complete or nearly complete, for which no delivery date is scheduled. Negotiations with possible lenders to this airline continue for some of the aircraft and offers to other customers have been made and are under consideration.

In addition, the account included the cost of two completed DC-10 aircraft, for which no customer had placed an order.

E. Investment in Finance Subsidiary

The investment in MDFC was represented by a capital investment of \$80.0 million and earnings retained for growth of \$44.8 million at 31 December 1981 and \$31.4 million at 31 December 1980. The condensed financial data presented below have been summarized from the audited consolidated financial statements of MDFC:

	31 DECEMBER		1981	1980
	ASSETS			
	Cash		\$ 5.8	\$ 6.3
	Notes and leases receivable - net		603.5	457.3
	Accounts with MDC		18.9	9.1
	Investment in operating leases		92.3	76.9
	Other assets		5.0	27.7
ì	To	tal	\$725.5	\$577.3
)	LIABILITIES AND EQUITY			
	Short-term notes payable:			
	MDC		\$ 99.5	\$ 26.8
	Other		98.4	98.8
	Accounts payable and accrued expe	enses	11.3	8.6
	Deferred income tax items		163.4	125.0
	Senior long-term debt			
	MDC		100.0	80.0
	Other		128.1	126.4
	Subordinated notes payable			.3
	Shareholder's equity		124.8	111.4
	To	tal	\$725.5	\$577.3
	YEARS ENDED 31 DECEMBER	1981	1980	1979
	Operating income	\$ 74.8	\$ 70.3	\$ 53.0
	Costs and expenses	59.6	41.4	31.8
	Net earnings	13.4	15.3	14.3

F. Credit Arrangements and Short-Term Borrowings

At 31 December 1981, MDC had open lines of credit of \$500.0 million with seventeen U.S. banks. Under these lines of credit, borrowings bear interest at the individual bank's current prime rate or at money market rates. At 31 December 1981, borrowings of \$244.0 million were outstanding.

MDCAN had a similar agreement with a Canadian bank for an open line of credit of \$50.0 million with borrowings

guaranteed by MDC. No borrowings were outstanding at 31 December 1981.

As compensation for extending these lines of credit, MDC has agreed with each bank either to maintain unrestricted compensating balances, or to pay fees, at rates which vary with each bank's prime rate. For the year ended 31 December 1981, fees of \$.8 million and average deposits of approximately \$9.8 million, plus float and other credits, were required to fulfill these requirements.

G. Income Taxes

Recoverable income taxes include the refund of prior years taxes from carryback of the 1980 operating loss and over payments of 1981 and 1980 estimated taxes.

Provisions for income taxes were at an effective rate of approximately 24% (8% in 1980 and 36% in 1979), which is less than the United States corporate rate of 46%, and the underlying causes of this difference and their effect on the income tax provisions are shown below:

YEARS ENDED 31 DECEMBER	1981	1980	1979
Pro forma income tax computed at U.S. corporate rates on pretax earnings	\$106.6	\$ 72.5	\$142.9
State income taxes net of			
federal tax benefit	7.9	4.3	7.0
	114.5	76.8	149.9
Less:			
Tax effect of permanent differences:			
Net earnings of MDFC	6.2	7.0	6.6
DISC tax-exempt income	25.0	25.0	10.0
Other - net	2.2	(.4)	(2.3
Tax rate differentials	5.9	12.5	12.4
Investment tax credits	20.0	19.6	11.8
	59.3	63.7	38.5
Income tax provision	\$ 55.2	\$ 13.1	\$111.4

At 31 December 1981, the undistributed earnings of subsidiaries which would be taxable under the Internal Revenue Code if distributed, but for which no provision for income taxes have been provided (see Note A, subcaption Income Taxes), amounted to \$257.9 million for DISCs and \$47.1 million for foreign subsidiaries.

Taxable income is determined for all long-term contracts using the completed contract method, and the difference between the methods used to determine income from long-term contracts for tax reporting and the financial statements is treated as a timing difference and is the principal factor underlying the deferred tax liability. The tabulation below presents a summary of the factors (estimated for 1981 and restated for 1980 and 1979 to the amounts shown on the tax returns filed) that contributed to the differences between the income taxes payable for the year and provisions for such taxes.

YEARS ENDED 31 DECEMBER	1981	1980	1979
United States corporation income ta	x:		
Current taxes:			
Tax for consolidated group	\$.5	\$.2	\$47.1
Net credit (charge) to			
unconsolidated subsidiaries			
for effect of including			
their operations in		- 24.22	
consolidated return	21.0	(2.5)	11.5
	21.5	(2.3)	58.6
Deferred taxes:			
Net effect of timing			
differences:			
Earnings on uncompleted			- 100000
contracts	89.5	93.5	130.0
Transitional adjustments	61.7	40.8	(95.6)
Other inventory valuations	(85.4)	(102.5)	(53.0)
DISC deemed dividends	(8.2)	(14.5)	33.9
Investment tax credit			
carryover	(17.7)	(25.3)	28.7
California franchise tax	(7.2)	3.2	2.4
Self insurance reserve	(2.6)	(7.5)	
Provisions for losses	(23.0)		
Exchange of property		6.0	
ACRS deduction	5.0		
Other	5.3	12.7	(7.9)
	17.4	6.4	38.5
Investment tax credits			
deferred, less amortization	(2.3)	(1.5)	(1.1)
	36.6	2.6	96.0
Foreign income taxes:			
Current	1.1	1.3	2.5
Deferred	2.9	1.3	(.1)
	4.0	2.6	2.4
State income taxes:	4.0	2.0	4.7
Current	.1	.6	13.3
Deferred	14.5	7.3	(.3)
	14.6	7.9	13.0
			1
Income tax provision	\$55.2	\$13.1	\$111.4

MDC's foreign operations which directly result in measurable foreign pretax earnings are not significant. The provision for foreign income taxes shown in the above table is based principally upon taxable intercompany sales and earnings that are eliminated in consolidation. These foreign operations consist of the manufacture of components used in domestic production, export marketing offices, and technical, training, and support services related to products exported or to foreign licensing agreements.

H. Long-Term Debt

The non-current 4¾% Convertible Subordinated Debentures, due 1991, amounted to \$32.7 million at 31 December 1981 (\$47.2 million at 31 December 1980), and the Indenture provides for retirement of a minimum (on a cumulative basis) of \$4.3 million of these Debentures annually through conversion, purchase and cancellation, or opera-

tion of a sinking fund. The Debentures are callable at any time (but at a premium to 30 June 1985) and are convertible at \$30.61 per share into MDC Common Stock. The conversion price and shares reserved for conversion are subject to adjustment in accordance with antidilution provisions of the Indenture.

Other long-term debt aggregated \$38.6 million at 31 December 1981 (\$28.7 million at 31 December 1980) and consisted of various notes and other obligations, all of which mature by 1998. Facilities having a carrying value of \$62.3 million were mortgaged or assigned as collateral for certain of these agreements.

The aggregate amounts of long-term debt maturing in the succeeding four years are as follows: 1983 - \$20.7 million; 1984 - \$2.1 million; 1985 - \$1.9 million; 1986 - \$11.9 million.

I. Stock Options

Options to purchase MDC Common Stock have been granted to officers and employes at 100% of current market prices, pursuant to plans approved by shareholders. Also, options were assumed in 1979 as part of the acquisition cost of Microdata Corporation, and are accounted for at the market price of MDC stock on the date of assumption. A summary of options for MDC Common Stock is shown below:

YEARS ENDED 31 DECEMBER	1981	1980	1979
Granted or assumed:			
Number of shares	154,626	149,387	495,256
Price per share	\$44	\$41	\$27 - \$30
Exercised:			
Number of shares	174,562	258,426	174,616
Price per share	\$17 - \$29	\$12 - \$29	\$12 - \$24
31 DECEMBER	1981	1980	1979
Outstanding:			
Number of shares	738,957	833,715	949,546
Price per share	\$21 - \$44	\$17 - \$41	\$12 - \$30
Exercisable:			
Number of shares	533,931	518,481	512,981
Price per share	\$21 - \$41	\$17 - \$29	\$12 - \$27

The MDC Incentive Compensation Plan is being amended to permit the granting of the new incentive stock options authorized by the Economic Recovery Act of 1981, and subject to shareholder approval, the granting of stock appreciation rights.

J. Reserved Common Shares

At 31 December 1981, authorized and unissued shares of MDC Common Stock have been reserved for conversions of the 434% Convertible Subordinated Debentures, 1,068,801 shares; contributions to the MDC Salaried Savings Plan, 757,070 shares; and stock options granted or authorized to be granted, 2,682,512 shares.

K. Retirement Plans

Substantially all employes of MDC and its subsidiaries are members of defined benefit pension plans, including several multi-employer and foreign plans. MDC makes contributions to its significant domestic pension plans and accrues pension expense in equal amounts based upon independent actuarial valuations, using the aggregate cost method without supplemental liability. Under this method, future contributions necessary to provide for plan benefits will be made during the remaining service lives of the active employes, as a level percentage of estimated future earnings or annual cost per member depending on the benefit formula. The total pension expense was \$194.3 million for 1981, \$177.3 million for 1980, and \$176.2 million for 1979.

Accumulated plan benefits and plan net assets, as of the anniversary dates for which actuarial studies have been completed, for MDC's significant domestic defined benefit plans are presented below:

30 NOVEMBER	1980	1979
Actuarial present value of accumulated plan benefits:		
Vested	\$1,357.4	\$1,170.3
Nonvested	174.2	153.2
	\$1,531.6	\$1,323.5
Net assets available for benefits	\$1,840.2	\$1,448.6

At 30 November 1980, one plan had accumulated plan benefits of \$121.9 million in excess of its net assets.

In accordance with Statement of Financial Accounting Standards No. 36, no future service or wage increases were considered in computing the accumulated plan benefits. A weighted average rate of return of 8% was used in both years to discount the accumulated plan benefits to present value.

L. Customer Financing Commitments

The marketing of commercial aircraft at times will result in agreements to provide or guarantee long-term financing of some portion of the delivery price of aircraft or to guarantee lease payments. At 31 December 1981, \$162.1 million of such guarantees were outstanding. Commitments of \$16.3 million were also outstanding to accept notes in payment for aircraft or to guarantee financing for customers, related to ordered but undelivered aircraft.

M. Litigation

Northrop Corporation initiated litigation on 26 October 1979 in the United States District Court in Los Angeles, California, concerning the rights and obligations of the parties with respect to the manufacture and sale of F-18 aircraft under certain agreements and conduct of the parties related to such agreements and aircraft. Northrop sought declaratory and injunctive relief, not less than \$100 million compensatory damages, treble damages for monopoliza-

tion and punitive damages. MDC counterclaimed for declaratory, injunctive, and monetary relief. On 2 December 1980 the Court dismissed Northrop's complaint and MDC's counterclaim on various grounds, also granting MDC summary judgment with respect to certain of Northrop's claims and Northrop summary judgment with respect to certain of MDC's counterclaims, including claims of limitations on F-18 aircraft which each party is entitled to sell. Northrop has appealed, and MDC has cross-appealed, the District Court's rulings.

MDC is also a defendant in a number of other legal proceedings, many of which are covered by insurance, in which substantial damages are sought. In the opinion of MDC, the ultimate liability, if any, of MDC in these proceedings should not be material in relation to the present financial position of MDC.

N. Leased Properties

The aggregate rental expense for leased properties was as follows:

YEARS ENDED 31 DECEMBER	1981	1980	1979
Minimum rentals	\$92.7	\$105.3	\$74.3
Contingent rentals	3.2	2.5	1.6
Sublease rental income	(12.4)	(11.5)	(11.6)
	\$83.5	\$ 96.3	\$64.3
			===

Minimum rentals include periodic rentals, and, in the case of computers and office equipment, usage charges. Contingent rentals represent payments to the United States Government under a lease, and under facilities contracts where payments are made only for usage on nongovernment work.

Minimum rental payments under operating leases with initial or remaining terms of one year or more at 31 December 1981 aggregated \$78.4 million, and payments due during the next five years were: 1982, \$25.4 million; 1983, \$18.1 million; 1984, \$10.1 million; 1985, \$6.7 million; and 1986, \$3.0 million.

O. Foreign Operations and Export Sales

The only material foreign operation of MDC is a Canadian subsidiary almost exclusively engaged in producing commercial aircraft components for shipment to the United States for assembly into complete aircraft.

All business segments made sales to foreign customers, although a significant portion of the export sales were through foreign military sales contracts with the U.S. Government. Foreign sales by geographical area, are shown in the table below:

YEARS ENDED 31 DECEMBER	1981	1980	1979
North America	\$ 576.5	\$ 156.9	\$ 136.6
South America	111.9	187.3	91.7
Europe	757.5	826.7	764.0
Asia/Pacific	493.9	540.3	563.6
Mideast/Africa	829.3	354.6	232.5
	\$2,769.1	\$2,065.8	\$1,788.4

REPORT OF ERNST & WHINNEY, INDEPENDENT AUDITORS

Shareholders and Board of Directors McDonnell Douglas Corporation St. Louis, Missouri

We have examined the consolidated balance sheet of McDonnell Douglas Corporation and consolidated subsidiaries as of 31 December 1981 and 1980, and the related consolidated statements of earnings, shareholders' equity and changes in financial position for each of the three years in the period ended 31 December 1981. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the consolidated financial position of McDonnell Douglas Corporation and consolidated subsidiaries at 31 December 1981 and 1980, and the consolidated results of their operations and the changes in their financial position for each of the three years in the period ended 31 December 1981, in conformity with generally accepted accounting principles applied on a consistent basis.

Ernst + Whinney

St. Louis, Missouri 28 January 1982

REPORT OF MANAGEMENT RESPONSIBILITIES

The financial statements of McDonnell Douglas Corporation and consolidated subsidiaries have been prepared under the direction of management in conformity with generally accepted accounting principles and, particularly with respect to long-term contracts and programs, include amounts based upon estimates and judgments. The integrity and objectivity of data in these financial statements is the responsibility of management and, in the opinion of management, the financial statements set forth a fair presentation of the consolidated financial condition of MDC at 31 December 1981 and 1980 and the consolidated results of its operations for the years ended 31 December 1981, 1980 and 1979.

MDC and its consolidated subsidiaries maintain accounting systems and related internal accounting controls which, in the opinion of management, provide reasonable assurances that transactions are executed in accordance with management's authorization, that financial statements are prepared in accordance with generally accepted accounting principles, and that assets are properly accounted for and safeguarded.

The Board of Directors has appointed four of its non-employe members as an Audit Committee. This Committee meets periodically with management and the internal and independent auditors. Both internal and independent auditors have unrestricted access to the Audit Committee to discuss the results of their examinations and the adequacy of internal accounting controls. In addition, the Audit Committee makes its recommendations as to the selection of independent auditors to the Board.

INFLATION AND CHANGING PRICES

Generally accepted accounting principles, as used to prepare the consolidated financial statements, were never meant to measure the effects of inflation and changing prices on enterprises. The Financial Accounting Standards Board has an experiment in process to develop understandable measurements of the effects of inflation and the data for MDC using the methodologies prescribed in the Standard is presented in the table below.

MDC's aerospace business is performed under long-term production contracts under which labor, materials and other costs are incurred after the contract is awarded. Generally, the prices in such contracts either take into account the expected inflation of future costs or provide for an adjustment based on inflation occurring during the period of contract performance. In the latter case, the adjustment may be based on the inflation actually experienced by the company or on appropriate published indexes of price changes. Accordingly, in the preparation of the restated amounts, neither contracts in process and inventories nor cost of goods sold were restated to the general premise embodied in the Standard that inventory and cost of goods sold should be at replacement cost.

Assets and liabilities of MDC were segregated between monetary and nonmonetary items, with the gain or loss from holding monetary items during the year computed by using the CPI-U as the measure of the decline in purchasing power of the dollar. Contracts in process and inventories, except for the deferred production and tooling costs were included with other monetary items as being committed to long-term contracts in process. Facilities at the beginning and end of the year, and depreciation for the year, were to be determined in terms of both general inflation and current costs, and the net earnings for the year and net assets at the end of the year adjusted to reflect such redeterminations. The effect of general inflation was determined using the changes in the CPI-U since the dates assets were placed in service, and current costs by using internally-appraised values for land and published construction and wholesale price indexes for other facilities.

The inflation measurements presented below include no adjustment from historical costs for the deferred start-up costs of commercial aircraft programs, which are neither monetary assets, inventory, nor facilities as defined in the Standard.

SUPPLEMENTARY INFLATION	N DATA, I	N AVERAC	3E 1981 DO	DLLARS	
YEARS ENDED 31 DECEMBER	1981	1980	1979	1978	1977
Dollar amounts in millions, except share data					
Sales	\$7,384.9	\$6,695.5	\$6,613.9	\$5,757.9	\$5,320.1
Net earnings, reduced by the increase in depreciation computed as if facilities costs had been restated for:					
General inflation	143.7	126.5	222.4		
—per share	3.62	3.20	5.65		
Current cost	144.1	124.2	217.9		
—per share	3.63	3.14	5.54		
Net assets at year-end, adjusted to reflect the cumulative increase in facilities costs for:					
General inflation	1,807.0	1,801.0	1,816.0		
Current cost	1,933.5	1,926.7	1,965.1		
Annual increase in current cost of facilities, less the annual increase therein from general inflation	(24.3)	(40.7)	(15.5)		
Gain (loss) from decline in purchasing power of net					
monetary assets	(45.4)	(45.2)	(20.8)		
Cash dividends declared — per share	1.06	.99	.94	.84	.75
Market price of MDC Common Stock at year-end — per share	28.79	52.06	43.25	44.64	39.15
Consumer Price Index — Urban (1967=100%)	272.4%	246.8%	217.4%	195.4%	181.5%

In the end-of-year 1981 dollars, facilities net of depreciation was \$1,072.0 million on a current cost basis, and \$910.8 million on a general inflation basis. In average 1981 dollars, the increase in facilities in 1981 was \$34.3 million on a current cost basis and \$58.6 million on a general inflation basis; the increase in depreciation in 1981 from historical cost was \$32.5 million on a current cost basis and \$33.0 million on a general inflation basis.

TEN YEAR CONSOLIDATED FINANCIAL SUMMARY

						,					
	YEARS ENDED 31 DECEMBER	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
	Dollar amounts in millions, except share data										
Summary of	Sales by class of products:						3				
Operations	Military aircraft	\$3,600.1	\$2,693.6	\$2,337.0	\$2,287.3	\$2,127.3	\$1,920.8	\$1,406.3	\$1,180.9	\$1,053.0	\$ 926.
	Commercial aircraft	2,447.2	2,219.5	1,932.1	953.8	682.9	1,029.9	1,312.7	1,374.0	1,334.5	1,147.
	Space systems and missiles	952.1	830.2	789.7	720.0	595. <i>7</i>	482.7	454.5	450.0	562.4	603.
	Computer services, electronics and other	385.5	323.0	219.7	169.2	138.9	110.3	82.2	70.1	52.7	48.
	Total sales	7,384.9	6,066.3	5,278.5	4,130.3	3,544.8	3,543.7	3,255.7	3,075.0	3,002.6	2,725
	Cost of products and services	6,296.4	5,240.9	4,435.3	3,395.9	2,914.3	2,965.3	2,720.5	2,480.8	2,389.1	2,165
	Research and development	215.7	199.0	194.0	168.8	123.9	105.6	132.2	139.5	142.8	147
	Interest and debt expense	69.8	11.7	10.8	6.8	10.1	23.9	40.3	50.6	25.2	28.
	Income taxes	55.2	13.1	111.4	120.3	93.4	70.8	40.1	70.6	97.1	83.
	Net earnings	176.6	144.6	199.1	161.1	123.0	108.9	85.6	106.7	133.3	97.
	Earnings per share	4.44	3.65	5.06	4.14	3.20	2.85	2.27	2.77	3.36	2.4
	Earnings as % of sales	2.39%	2.38%	3.77%	3.90%	3.47%	3.07%	2.63%	3.47%	4.44%	3.58
	Earnings as a % of beginning equity	11.68%	10.49%	16.59%	15.26%	13.01%	12.85%	11.09%	15.48%	23.06%	20.44
	Cash dividends declared	41.2	34.4	28.1	22.3	18.4	16.1	14.5	14.7	14.3	11
	Cash dividends declared per share	1.06	.90	.75	.60	.50	.44	.40	.40	.38	.3
Financial	Current assets	\$3,014.2	\$2,919.8	\$2,580.8	\$2,480.1	\$201.3	\$1(0.8	\$1,813.6	\$1,807.2	\$1,574.1	\$1,423
Position on	Facilities (net)	727.4	623.9	449.3	343.2	249.6	237.7	243.6	254.2	259.9	268
31 December	Other assets	622.6	356.1	350.5	274.9	199.6	170.1	150.6	164.3	153.5	152
	Total assets	\$4,364.2	\$3,899.8	\$3,380.6	\$3,098.2	\$2,467.5	\$2,129.6	\$2,207.8	\$2,225.7	\$1,987.5	\$1,844
	Current liabilities	\$2,639.4	\$2,311.4	\$1,915.7	\$1,822.7	\$1,332.2	\$1,046.3	\$1,115.1	\$1,349.4	\$1,180.7	\$1,120
	Long-term debt	71.3	75.9	86.7	75.7	79.5	138.0	245.7	104.0	117.8	146
	Shareholders' equity	1,653.5	1,512.5	1,378.2	1,199.8	1,055.8	945.3	847.0	772.3	689.0	578
	Total liabilities and shareholders' equity	\$4,364.2	\$3,899.8	\$3,380.6	\$3,098.2	\$2,467.5	\$2,129.6	\$2,207.8	\$2,225.7	\$1,987.5	\$1,844
	Shareholders' equity per share	\$42.93	\$39.50	\$36.75	\$32.23	\$28.53	\$25.73	\$23.23	\$21.31	\$18.54	\$15.
General	Expenditures for facilities (net)	\$ 225.6	\$ 265.9	\$ 156.7	\$ 142.1	\$ 54.8	\$ 40.9	\$ 33.1	\$ 35.0	\$ 33.1	\$ 23
nformation	Depreciation of facilities	\$ 109.2	\$ 203.9	\$ 130.7	\$ 48.5	\$ 43.0	\$ 40.9	\$ 33.1	\$ 40.7	\$ 41.4	\$ 42
	Floor area, in millions of gross square feet	28.8	\$ 91.3 27.9	26.8	25.6	25.2	24.8	24.3	27.5	27.7	27
	Shares outstanding on 31 December (in millions)	38.5	38.3	37.5	37.2	37.0	36.7	36.5	36.2	37.2	37
	Shareholders of record on 31 December	52,934	54,420	57,631	57,496	62,432	66,637	72,765	72,672	68,588	66,6
	Personnel on 31 December	74,264	82,550	82,736	70,547	61,577	57,867	62,830	70,739	78,799	86,7
	Payroll	\$2,025.4	\$1,922.2		\$1,293.0		\$1,010.0	\$ 992.6	\$1,082.6	\$1,105.8	\$1,162
	Firm backlog on 31 December			\$1,634.8		\$1,079.5	San Care and California				\$4,071
	THIII DACKION OIL 21 DECEMBEL	\$8,857.8	\$8,815.5	\$6,981.7	\$6,038.1	\$4,626.8	\$2,988.1	\$2,951.8	\$3,199.8	\$3,509.1	Φ±,0/1

Firm backlog excludes (a) government orders not yet funded to us, (b) government orders being negotiated as continuations of authorized programs and (c) commercial orders subject to contingencies. Contingent backlog is (a) plus (b) plus (c), and was approximately \$5,900.8 million. Total backlog is firm plus contingent backlog, and was approximately \$14,758.6 million or 31 December 1981 and \$13,777.8 million on 31 December 1980. The firm backlog at 31 December 1981 was 18% commercial and 82% government business, while total backlog was 15% commercial and 85% government business. Customer options are not included in backlog.

SUPPLEMENTAL INFORMATION

Quarterly Results of Operations:

The table below presents unaudited quarterly financial information for the years ended 31 December 1980 and 1981.

		Gross	Net	Earnings
Quarter	Sales	Margin	Earnings	Per Share
YEAR ENDED 31 I	DECEMBER 1980:			
1st	\$1,423.9	\$205.9	\$43.4	\$1.10
2nd	1,617.1	221.3	43.7	1.10
3rd	1,520.0	171.6	11.7	.30
4th	1,505.3	226.6	45.8	1.15
YEAR ENDED 31 I	DECEMBER 1981:			
1st	\$1,626.4	\$267.9	\$41.3	\$1.03
2nd	1,884.2	280.2	48.3	1.21
3rd	1,777.1	280.6	51.7	1.30
4th	2,097.2	259.8	35.3	.90

Earnings per share were impacted severely by an unusually large write-off (\$.80 a share) attributable to the introduction of the DC-9 Super 80 in the third quarter of 1980 and by a provision (\$.64 a share) for restructuring or default on some commercial airline financing transactions in the fourth quarter of 1981. The effect on the 1981 earnings from the early adoption of SFAS No. 52 (\$.05 a share) was not material and was reflected in the fourth quarter.

Quarterly Common Stock Prices and Dividends:

The range of market prices for a share of MDC Common Stock is shown below, by quarters for 1981 and 1980. Prices are as reported in the consolidated transaction reporting system.

	19	81	1980		
Quarter	High	Low	High	Low	
1st	\$49 5/8	\$40 7/8	\$52 7/8	\$34 3/4	
2nd	44 1/8	35	39 3/4	25 1/4	
3rd	39 3/8	22 1/2	39 1/4	29 3/4	
4th	33 3/4	25 1/2	49 3/8	33	

Cash dividends of \$.265 a share were declared for each quarter in 1981 and \$.225 a share each quarter in 1980.

Transfer Agents:

Shareholder Records Department, McDonnell Douglas Corporation; Centerre Trust Company of St. Louis; The Chase Manhattan Bank, New York

Registrars:

Centerre Trust Company of St. Louis; Chemical Bank, New York

Stock Exchanges:

McDonnell Douglas Corporation Common Stock is listed on the New York, Pacific, Brussels and Amsterdam Stock Exchanges.

Form 10-K and McDonnell Douglas Finance Corporation annual report:

Upon written request of any shareholder to Bryson R. Younger, Manager-Shareholder Records, McDonnell Douglas Corporation, P.O. Box 516, St. Louis, Missouri, 63166, MDC will furnish without charge a copy of its most recent Annual Report on Form 10-K filed with the Securities and Exchange Commission. The separate MDFC annual report can be requested in the same way.



BOARD OF DIRECTORS

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IOHN C. BRIZENDINE, President DAC

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JAMES S. MCDONNELL III, Corporate Vice President - Marketing

JAMES T. MCMILLAN, President MDFC

*WILLIAM R. ORTHWEIN, IR., Chairman MCAUTO

JOHN T. SANT, Corporate Vice President - General Counsel

WILLIAM A. MCDONNELL, Advisory Director; Retired Chairman of the Board, First National Bank in St. Louis

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MICHAEL WITUNSKI, Staff Vice President

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*Also Corporate Vice President

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SECTION C

WASTE CHARACTERISTICS

This section describes the chemical and physical nature of the hazardous wastes stored at the McDonnell Douglas Corporation - St. Louis (MDC-St. Louis) facility and the Waste Analysis Plan for sampling, testing, and evaluating the wastes to assure that sufficient information is available for their safe handling. The information submitted is in accordance with the requirements of 40 CFR \S 122.25(a)(2) and (3).

- C-1 Chemical and Physical Analyses [40 CFR 122.25(a)(2) and 10 CSR 25-7.011(3)(c)]
 List of Hazardous Wastes Stored at the Facility: Hazardous wastes are stored at this facility in 55-gallon drum containers, underground, inground, and aboveground tanks and a containerized explosive storage building. The capability of these areas are as follows:
 - I) Containers 37,620 gallons;
 - II) Two 10,000-gallon above-ground tanks;
 - III) Five 500-gallon above-ground tanks;
 - IV) Six 750-gallon above-ground tanks;
 - V) One 3,380-gallon below-ground tank;
 - VI) Two 2,000-gallon below-ground tanks;
 - VII) One 2,000-gallon below-ground tank;
 - VIII) One 5,000-gallon below-ground tank;
 - IX) One 1,000-gallon below-ground tank;
 - X) One 120,000-gallon inground tank;
 - XI) Explosive Storage Building, 30,300 gallons, containerized;
 - XII) One 4,380-gallon below-ground tank.

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These areas are detailed as follows:

- I) The container storage area consist of two separate storage areas. Area No. 1 is divided into two categories by a six-inch high curb. Each section has its own sump to accumulate any leakage that occurs. Acids and alkalis are stored in one section, and oils, solvents and paint sludges are stored in the other section. Area No. 2 is used for storing cyanides and sulfides. This area also has its own sump. These areas receive a variety of wastes shown in Table No. C-1.
- II) The two 10,000-gallon above ground tanks are used to hold waste alkaline solution (sodium hydroxide) from aluminum chemical milling. Production department process tank drains are connected to these tanks and only these waste solutions enter the storage tanks. This waste is hazardous due to E P Toxicity (D007)(Cr^{+6}) and Reactivity (D003) (S^{-2}). Any leaks are contained by an impervious asphalt curb and directed into the industrial wastewater sewer that serves this process area. The industrial wastewater sewer leads to a company owned and operated waste water pretreatment plant which discharges its effluent to a local sanitary sewer district.
- III) The five 500-gallon above ground tanks are used to hold waste acid solutions (nitric acid, hydroflouric acid) from titanium chemical milling. Production department process tank drains are connected to these tanks and only these waste solutions enter the storage tanks. This waste is hazardous due to Corrosivity (pH) (D002). Leaks are contained by an impervious asphalt curb and directed into the previously mentioned industrial wastewater sewer.

- IV) The six 750-gallon above-ground tanks are used to hold waste acid solution (nitric acid, hydrofluoric acid) from titanium chemical milling. The Production Department process tank drain is connected to these tanks and only this waste solution enters the storage tanks. This waste is hazardous due to Corrosivity (pH), DOO2. Leaks are contained by a two-stage impervious asphalt curb. Each curbed area is drained into the previously mentioned industrial waste water sewer. This curb system is designed so that if the primary curbing fails for any reason, the secondary curb system will provide 100% redundancy.
 - V) The one 3,380-gallon underground tank is used to hold waste turbine engine (jet aircraft) fuel and hydraulic system spillage. This tank accumulates waste in two fashions. First, an oil separator serves an area where aircraft have their engines adjusted. Any spills or leaks during this operation enter this separator and are diverted to the underground tank. Second, when an aircraft is fueled, catch dollies are positioned at the aircraft tank vents to collect overfilling. These dollies are emptied directly into this underground tank. This waste is hazardous due to Ignitability (flash point), DOO1. The tank is equipped with a liquid level-sensing system that indicates when the tank is approximately 80% full. This system signals this condition in the area Maintenance shop and is used to determine removal frequency. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well located adjacent to this buried tank.

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VI) The two 2,000-gallon underground tanks are used to collect and hold waste turbine engine (jet aircraft) fuel that is spilled during fueling or defueling operations. These tanks are equipped with level indicator systems that sound an alarm when they become approximately 75% full.

This alarm alerts area Maintenance to initiate waste removal activities. This waste is hazardous due to Ignitability (flash point), D001. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well located adjacent to this buried tank.

- VII) The one 2,000-gallon underground tank is used to collect waste turbine engine (jet engine) fuel and hydraulic system spillage. An oil separator serves the work area. Any spills that occur enter the separator and are diverted to the underground tank. This waste is hazardous due to Ignitability (flash point), DOO1. This tank is equipped with a level indicator system that flashes an alarm when it becomes approximately 75% full. This alarm alerts area Maintenance to initiate waste removal activities. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well located adjacent to this buried tank.
- VIII) The one 5,000-gallon underground tank is used to hold jet aircraft fuels that are leaked or spilled during the testing of aircraft fuel systems. Fuels enter a separator where they are diverted into this underground tank. This waste is hazardous due to Ignitability (flash point), DOO1. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well located adjacent to this buried tank.

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- IX) The one 1,000-gallon underground tank is used to hold oil that has been separated from the condensate of an oil-lubricated, steam-operated compressor. This waste contains more than 10% oil and is therefore defined as hazardous waste by Missouri Regulation 10 CSR 25-4.020. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well located adjacent to this buried tank.
- X) The one 120,000-gallon inground tank is an open top tank. This tank is used to contain waste water treatment sludge prior to dewatering. This sludge is a hazardous waste from non-specific source (F006 and F019). The only fill line to this inground tank is from the sludge-accumulating tanks of the waste water pretreatment plant. This inground tank is equipped with an overflow drain which leads to the influent of our waste water pretreatment plant.
- XI) The 30,300-gallon storage area is used to contain ammunition and explosives that have been declared waste because they are outdated or have been damaged. This area is a designated section of the building that is used to contain the non-waste ammunition and explosives.
- XII) The one 4,380-gallon underground tank is used to collect waste turbine engine (jet engine) fuels that are leaked or spilled during the repair of aircraft fuel systems. Fuels enter a separator, where they are diverted into this underground tank. This waste is hazardous due to Ignitability (flash point), DOO1. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well located adjacent to this buried tank.

C-2 <u>Waste Analysis Plan (40 CFR 122.25 (a)(3))</u>

This plan details the procedure that MDC - St. Louis follows in determining the classification of wastes. The Environmental Pollution Control (EPC) Section of the Plant Engineering (P.E.) Department is responsible for monitoring all wastes, hazardous and non-hazardous, generated at this site. EPC administers all contracts for removal and disposal of all wastes at this site. The details of the steps used are as follows:

- Step 1 EPC becomes aware of waste in several ways. These ways are
 - a) Process Specifications, b) Manufacturing Method Procedures,
 - c) generating department requests a removal.
- Step 2 After becoming aware of the present or near-future need for disposal of a waste, EPC requests technical data concerning the chemical composition of the components of the waste.
- Step 3 Technical data is received by EPC, and a specific file is developed for this waste.
- A duplicate sample of waste is obtained. The first half of this sample is forwarded to an independent testing laboratory for a complete profile analysis. The test parameters are based on the technical information received in Step 3 and any additional knowledge regarding the solution usage available from the generating department.
- Step 5 The independent testing laboratory forwards a report of analysis to EPC. This report becomes part of the file generated in Step 3. The analysis is reviewed and the waste is classified as being hazardous or non-hazardous, according to the definitions listed in 40 CFR Part 261 and 10 CSR 25-4.010.

- Step 5A If the waste is non-hazardous by both federal and state regulations, then the in-plant source is contacted and instructed as to how to discard the waste.
- Step 5B If the waste is hazardous by either or both federal and state regulations, then the in-plant source is contacted and instructed to contact EPC whenever a removal is required. If this waste category has not already been registered for this site, then notification is forwarded to the appropriate federal or state agency.
- When a hazardous waste removal is required, the in-plant source contacts EPC. EPC forwards a sample analysis request (Form MAC 4605) to the MCAIR Quality Assurance (QA) analytical laboratory, requesting specific verification analysis (i.e. pH, specific gravity, % specific acid, % specific alkaline). QA obtains a sample and performs requested tests. QA analyst records test results on Analysis Request Form, signs and dates form, and returns completed form to EPC.
- Step 7 EPC compares QA tests results against original independent testing laboratory profile analysis to verify waste composition.
- Step 7A If the results are not comparable, a second sample is taken and sent to a different QA laboratory and the original QA laboratory is requested to recheck its analysis. If this "set" of results do not agree with each other, a sample is forwarded to an independent testing laboratory for a new profile analysis (Note: This reverts to Step 4).

Step 7B If the results are comparable, EPC contacts the appropriate hazardous waste transporter and treatment, storage, disposal facility (TSDF) and arranges for removal. If bulk removal is required, EPC initiates a Maintenance Department Work Request to provide labor to transfer the hazardous waste to the transporter's vehicle. (Note: The Maintenance Department has been instructed not to move any waste known to be or suspected to be hazardous waste until authorized to do so by EPC.)

When the bulk removal involves transportation to a treatment or disposal facility (waste accountability transfers from MCAIR to non-MCAIR transporter), a sample is removed from the bulk tanker and kept by EPC. The purpose of this sample is to provide proof of what has actually been taken away from this site in the event of an accident or discrepancy in analysis at the treatment or disposal site.

If drum removal is required, EPC directs the Maintenance Department to deliver the proper DOT-approved empty drums to the waste location. The drums are filled, and the generating department supervision identifies, dates, signs, and affixes a tag to each drum. EPC inspects drums for the proper tag, adds a Hazardous Waste label, and issues a Maintenance Department Work Request to relocate the filled drums to the Hazardous Waste Drum Storage area. If the drums are being sent from another MCAIR site to the MCAIR storage site, EPC prepares the

Step 7B (Continued)

necessary manifest. Once the drums are received in the Container Storage Area, the EPC operator keeps daily records of the inventory, and upon accumulation of sufficient quantity, initiates a removal to a treatment or disposal facility. The analysis of the drum contents has already been obtained in Step 6.

- C-2a Parameters and Rationale
 - Table C-1 shows the various hazardous wastes that may be stored at this facility, the analytical parameters that apply to each, the rationale for their selection, the DOT shipping name, and the DOT identification number.
- C-2b Test Methods

Table C-2 shows the test methods that are used to measure the analytical parameters. All test methods are from Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982, or other EPA-approved methods.

C-2c&d Sampling Methods/Frequency of Analysis

Table C-3 lists: (1) the methods used to sample each of our hazardous waste streams; and (2) the frequency of analysis. Note that this frequency is based on no known changes occurring in the individual hazardous waste stream; therefore, this will provide proof of no change. When known changes do occur, we perform a waste stream analysis to determine if there is any change in the hazardous waste characteristics.

C-2e Additional Requirements for Waste Generated Off-Site

This facility handles on-site generated wastes and also off-site generated waste BUT only from other MDC - St. Louis generating sites located in the metropolitan St. Louis, Missouri area. ALL of these sites are under the same hazardous waste handling management (Environmental Pollution Control) and ALL previously discussed procedures in this section apply to this storage facility and also the other generating sites. The Environmental Pollution Control (EPC) section strictly monitors and controls all hazardous waste generated at all of our generating sites. Figures C-1 and C-2 explain in detail the close control that EPC exercises over the hazardous waste.

Figure C-3 is the form used to request a complete profile analysis of a known or suspected hazardous waste from an independent laboratory.

Figures C-4 through C-9 are examples of typical lab analysis reports.

Figure C-10 is the form used to request analysis verification from our in-house laboratory prior to each removal.

Figure C-11 is the self-adhesive tag that is used to identify each container of hazardous waste.

Figure C-12 is the Maintenance Work Order ticket that is used to request movement of hazardous waste containers to the storage shelter.

TABLE C-1

WASTE CHARACTERISTICS

PARAMETERS AND RATIONALE FOR THEIR SELECTION

MO ID NO.	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
001	Waste acid solution from titanium metal surface cleaning. (Nitric and Chromic Acid)	pH; EP Toxicity (Cr ⁺ 6, Cd)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
003	Waste acid solution from oxide removal on aluminum and titanium surfaces. (Nitric Acid, Potassium Dichromate, Potassium Nitrate, Sodium Bifluoride)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
006	Waste acid and chlorinated solvent from paint stripping. (Hydrofluoric Acid with Phenol and Methylene Chloride)	pH; EP Toxicity (Cr+6) (Listed Waste)	This solution is a Hazardous Waste due to EP Toxicity (D007) and is a generic Hazardous Waste (F002).	Waste Corrosive Liquid, N.O.S.	UN1759
008	Waste acid solution from a chemical conversion coating process of aluminum and titanium surfaces. (Chromic Acid, Fluorides, Ferricyanide)	pH; EP Toxicity (Cr+6); Reactivity (Ferricyanide)	This solution is a Hazardous Waste due to EP Toxicity (D007); Corrosivity (D002); and Reactivity (D003).	Waste Corrosive Liquid, N.O.S.	UN1760
009	Waste acid and chlorinated solvent solution from a coating removal operation. (Methylene Chloride, Formic Acid, Phenol)	pH (Listed Waste)	This solution is a Hazardous Waste due to Corrosivity (D002) and is a generic waste (F002).	Waste Corrosive Liquid, N.O.S.	UN1760

TABLE C-1

MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
010	Waste acid solution from aluminum metal surface cleaning. (Sulfuric Acid, Sodium Dichromate)	pH; EP Toxicity (Cr ⁺⁶)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Corrosivity (D002).	Waste Sulfuric Acid Mixture	UN1830
012	Waste acid solution from cleaning and pickling aluminum and titanium. (Nitric and Hydro-fluoric Acid)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760
013	Waste acid solution from chromic acid anodizing df aluminum and titanium. (Chromic Acid, Ferric Nitrate, Potassium Fluoride)	pH; EP Toxicity (Cr+6, Cd, Pb)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760
014	Waste acid solution from an aluminum hard coating operation. (Sulfuric and Oxalic Acid)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760
016	Waste acid from stainless steel pickle or pretreatment. (Hydrochloric Acid)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) EP Toxicity (D007).	Waste Hydrochloric Acid	UN1789
017	Waste solution from stripping cadmium plating. (Ammonium Nitrate)	EP Toxicity (Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006).	Waste Ammonium Nitrate Solution	NA2426
021	Waste acid from a stainless steel cleaning process. (Hydrofluoric and Sulfuric Acid)	рH	This solution is a Hazardous Waste due to Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760

MO ID NO.	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
022	Waste acid solution and sludge from various metal etching and cleaning. (Nitric, Chromic, Hydrofluoric Acids)	pH; EP Toxicity (Cr ⁺⁶ , Pb)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007, D008).	Waste Corrosive Liquid, N.O.S.	UN1760
023	Waste acid solution from metal surface passivation. (Nitric Acid)	pH	This solution is a Hazardous Waste due to Corrosivity (DOO2).	Waste Nitric Acid	UN2031
024	Waste alkaline solution from stripping of chromium plating. (Sodium Hydroxide, Sodium Carbonate, Sodium Phosphate, Chromium)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Sodium Hydroxide Solution	UN1824
025	Waste alkaline solution from derust cleaning of metal parts. (Sodium Hydroxide, Triethanola-mine, Sodium Gluconate, Kerosene)	pH; EP Toxicity (Cr ⁺⁶)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Alkaline Liquid, N.O.S.	NA1719
026	Waste alkaline solution from cadmium cyanide plating operation. (Sodium Cyanide, Sodium Hydroxide, Cadmium Oxide, Sodium Carbonate)	EP Toxicity (Cd) (NaCN); Reacti- vity (Cyanide)	This solution is a Hazardous Waste due to EP Toxicity (D006) and Reactivity (D003).	Waste Corrosive Liquid, Poison, N.O.S.	UN2922
028	Waste potassium dichromate solu- tion from anodize sealing.	EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760

TABLE C-1

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MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
029	Waste alkaline cleaning solution from cleaning aluminum. (Sodium Tripolyphosphate, Sodium Borate, Sodium Nitrate, Sodium Chromate)	EP Toxicity (Cr ⁺⁶ , Pb)	This solution is a Hazardous Waste due to EP Toxicity (D007, D008).	Hazardous Waste, Liquid, N.O.S.	NA9189
031	Waste ferric chloride solution from metal etching.	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Ferric Chloride Solution	UN2582
035	Waste alkaline solution from aluminum chemical milling.	EP Toxicity (Cr ⁺⁶); Reactivity (S ²)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Reactivity (D003).	Waste Sodium Hydroxide Solution	UN1824
036	Sludge from industrial waste water pretreatment plant.	Listed Waste	This solution is a Hazardous Waste because it is a waste water treatment sludge from electroplating operations (F006) and aluminum chemical conversions (F019).	Hazardous Waste, Liquid, N.O.S.	NA9189
037	Water-emulsified cutting oil from cutting and machining aluminum, titanium and ferrous base metals and alloys.	Missouri Listed Waste	Contains more than 10% oil and is defined as Hazardous Waste by Missouri Regulation 10 CSR 25-4.020.	Not Regulated	Not Regulated
038	Solid hazardous waste from air- craft painting and servicing.	EP Toxicity (Pb)	This is a Hazardous Waste due to EP Toxicity (D008).	Hazardous Waste, Solid, N.O.S.	NA9189

MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT: ID NUMBER
039	Explosive devices which have exceeded their service lives or have been damaged so that they are not usable.	Explosive Devices DOT Classes "B" and "C"	This material is a Hazardous Waste due to Reactivity (D003).	Hazardous Waste, Solid, N.O.S.	NA9189
040	Waste paint sludge from aircraft and building maintenance.	EP Toxicity (Cr ⁺⁶)	This material is a Hazardous Waste due to EP Toxicity (D007).	Hazardous Waste, Solid, N.O.S.	NA9189
041	Waste chlorinated solvents from metal cleaning, degreasing operations, and paint stripping.	Trichloroethy- lene, methylene chloride, 1,1,1- trichloroethane (Listed Waste)	This material is a Hazardous Waste from nonspecific sources (F001, F002, D008).	Waste ORM-A, N.O.S.	NA1693
042	Waste jet fuel contaminated with water.	Flash Point	This waste is ignitable (D001).	Waste Flammable Liquid, N.O.S.	UN1993
043	Mixed waste solvents.	Acetone, xylene, toluene, methyl ethyl ketone (Listed Waste)	Flash Point; this waste is ignitable (D001) and a Hazardous Waste from nonspecific sources (F003, F005).	Waste Flammable Liquid, N.O.S.	UN1993
044	Waste hydraulic and motor oil.	Missouri Listed Waste	Contains more than 10% oil and is defined as Hazardous Waste by Missouri Regulation 10 CSR 25-4.020.	Hazardous Waste, Liquid, N.O.S.	NA9189
045	Waste coolant from metal cutting. (Triethanolamine, Sodium Nitrite, Potassium Chromate)	EP Toxicity (Cr ⁺⁶)	This solution is Hazardous Waste due to EP Toxicity (D007).	Hazardous Waste, Liquid, N.O.S.	NA9189

TABLE C-1

MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
049	Waste solution and sludge from developing x-ray film, photos, microfiche, and microfilm (Silver Sludge).	EP Toxicity (Ag)	This solution is a Hazardous Waste due to EP Toxicity (D011).	Hazardous Waste, Liquid, N.O.S.	NA9189
050	Empty containers which have contained hazardous waste.	Para. 261.33(C)	These containers have held a commercial chemical product listed in Para. 261.33(C) and have not been triple rinsed. MO Waste (MK13)		
052	Waste sodium bicarbonate or potassium hydroxide with phenol.	EP Toxicity (As, Cr ⁺⁶); pH	This solution is a Hazardous Waste due to EP Toxicity (D004, D007) and Corrosivity (D002).	Not Regulated	Not Regulated
053	Waste sodium bicarbonate used to neutralize an acid spill.	EP Toxicity (Cr ⁺⁶)	This is a Hazardous Waste due to EP Toxicity (D007).	Not Regulated	Not Regulated
054	Compressed gases.	Para. 261.33	These wastes are listed commercial chemical products (ignitable, corrosive, hazardous toxic).	•	
056	Waste acid solution for stripping nickel plating.	EP Toxicity (Cd, Cr ⁺⁶ , Pb)	This solution is Hazardous Waste due to EP Toxicity (D006, D007, D008).		UN1760
057	Sodium hydroxide solids from fume scrubber.	рН	This is a Hazardous Waste due to Corrosivity (D002).	Waste Corrosive Solids, N.O.S.	UN1759

MO ID NO.	HAZARDOUS WASTE	HAZARDOUS Parameter	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
059	Synthetic fuel (fuel oil, coal, and water).	Missouri Listed Waste	This is a Hazardous Waste because it contains more than 10% oil and is defined as Hazardous Waste by Missouri Regulation 10 CSR 25-4.020.	Not Regulated	Not Regulated
063	Lime	рН	This is a Hazardous Waste due to Corrosivity (D002).	Not Regulated	Not Regulated
069	Plating solution for ferrous and non-ferrous alloys (nickel sulfamate, boric acid).	EP Toxicity (Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006).	Hazardous Waste, Liquid, N.O.S.	NA9189
070	Phosphatizing of ferrous metal (phosphoric acid).	EP Toxicity (Cd, Pb); Reactivity (CN)	This solution is a Hazardous Waste due to EP Toxicity (D006, D008) and Reactivity (D003).	Waste Corrosive Liquid, N.O.S.	UN1760
075	Mold material for die-casting metals.	pH; EP Toxicity (As, Ba, Cd, Pb, Se)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D004, D005, D006, D008, D010).	Hazardous Waste, Liquid, N.O.S.	NA9189
080	Miscellaneous laboratory chemi- icals packed in a 55-gallon "lab pack".	EP Toxicity (As, Ba, Cd, Cr ⁺⁶ , Pb, Se, Ag); Reacti- vity (CN); pH; Flash Point	This is a Hazardous Waste due to EP Toxicity (D004, D005, D006, D007, D008, D009, D010, D011), Reactivity (D003), Ignitability (D001), and Corrosivity (D002).	Will vary with each drum and will be specified at the time of shipment.	Will vary

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	MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
	086	Metal treating solution in tooling manufacturing	рН	This solution is a Hazardous Waste due to Corrosivity (D002).	Waste Sodium Hydroxide Solution	UN1824
	880	Scale conditioner for exotic scales on metals	pH; Reactivity (CN)	This solution is a Hazardous Waste due to Corrosivity (D002, D003).	Hazardous Waste, Solid, N.O.S.	NA9189
	091	Miscellaneous acid sludges	pH; EP Toxicity (Cd, Cr ⁺⁶)	This sludge is Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007 and D008).	Waste Corrosive Solids, N.O.S.	UN1759
	092	Miscellaneous alkaline sludges	pH; EP Toxicity; Reactivity (CN)	This sludge is Hazardous Waste due to Corrosivity (D002), EP Toxicity (D007, D008), and Reactivity (D003).	Waste Corrosive Solids, N.O.S.	UN1759
<u>R-</u>	2					R
	002	Laboratory scale plating bath	pH; Reactivity (CN)	This solution is a Hazardous Waste due to Corrosivity (D002, D003).	Hazardous Waste, Liquid, N.O.S.	NA9189
	004	Waste acid and rinse water from metal cleaning	pH	This solution is a Hazardous Waste due to Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
0	005	Excess paint removed from part racks	pH; EP Toxicity (Cr ⁺⁶ , Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006, D007) and Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
	007	Laboratory spray operations	pH; EP Toxicity (Cd)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D006).	Waste Corrosive Liquid, N.O.S.	UN1760

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TABLE C-1

	1D 0.	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
	11	Laboratory reversal solution from photoetching	EP Toxicity (Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006).	Hazardous Waste, Liquid, N.O.S.	NA9189
0	15	Laboratory scale indium plating solution	EP Toxicity (Hg); Reactivity (Cyanide)	This solution is a Hazardous Waste due to EP Toxicity (D009) and Reactivity (D003).	Hazardous Waste, Liquid, N.O.S.	NA9189

NOTE: Missing Missouri ID Numbers indicate that the waste is not being generated at this time, or is no longer classified as Hazardous Waste, or has been combined with another Missouri ID Number which was a similar waste.

These areas are detailed as follows:

- I) The container storage area consist of two separate storage areas. Area No. 1 is divided into two categories by a six-inch high curb. Each section has its own sump to accumulate any leakage that occurs. Acids and alkalis are stored in one section, and oils, solvents and paint sludges are stored in the other section. Area No. 2 is used for storing cyanides and sulfides. This area also has its own sump. These areas receive a variety of wastes shown in Table No. C-1.
- II) The two 10,000-gallon above ground tanks are used to hold waste alkaline solution (sodium hydroxide) from aluminum chemical milling. Production department process tank drains are connected to these tanks and only these waste solutions enter the storage tanks. This waste is hazardous due to E P Toxicity (D007)(Cr^{+6}) and Reactivity (D003) (S^{-2}). Any leaks are contained by an impervious asphalt curb and directed into the industrial wastewater sewer that serves this process area. The industrial wastewater sewer leads to a company owned and operated waste water pretreatment plant which discharges its effluent to a local sanitary sewer district.
- III) The five 500-gallon above ground tanks are used to hold waste acid solutions (nitric acid, hydroflouric acid) from titanium chemical milling. Production department process tank drains are connected to these tanks and only these waste solutions enter the storage tanks. This waste is hazardous due to Corrosivity (pH) (D002). Leaks are contained by an impervious asphalt curb and directed into the previously mentioned industrial wastewater sewer.

TABLE C-1

WASTE CHARACTERISTICS

PARAMETERS AND RATIONALE FOR THEIR SELECTION

MO ID NO.	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
001	Waste acid solution from titanium metal surface cleaning. (Nitric and Chromic Acid)	pH; EP Toxicity (Cr ⁺ 6, Cd)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
003	Waste acid solution from oxide removal on aluminum and titanium surfaces. (Nitric Acid, Potassium Dichromate, Potassium Nitrate, Sodium Bifluoride)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
006	Waste acid and chlorinated solvent from paint stripping. (Hydrofluoric Acid with Phenol and Methylene Chloride)	pH; EP Toxicity (Cr+6) (Listed Waste)	This solution is a Hazardous Waste due to EP Toxicity (D007) and is a generic Hazardous Waste (F002).	Waste Corrosive Liquid, N.O.S.	UN1759
008	Waste acid solution from a chemical conversion coating process of aluminum and titanium surfaces. (Chromic Acid, Fluorides, Ferricyanide)	pH; EP Toxicity (Cr+6); Reactivity (Ferricyanide)	This solution is a Hazardous Waste due to EP Toxicity (D007); Corrosivity (D002); and Reactivity (D003).	Waste Corrosive Liquid, N.O.S.	UN1760
009	Waste acid and chlorinated solvent solution from a coating removal operation. (Methylene Chloride, Formic Acid, Phenol)	pH (Listed Waste)	This solution is a Hazardous Waste due to Corrosivity (D002) and is a generic waste (F002).	Waste Corrosive Liquid, N.O.S.	UN1760

TABLE C-1

MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
010	Waste acid solution from aluminum metal surface cleaning. (Sulfuric Acid, Sodium Dichromate)	pH; EP Toxicity (Cr ⁺⁶)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Corrosivity (D002).	Waste Sulfuric Acid Mixture	UN1830
012	Waste acid solution from cleaning and pickling aluminum and titanium. (Nitric and Hydro-fluoric Acid)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760
013	Waste acid solution from chromic acid anodizing df aluminum and titanium. (Chromic Acid, Ferric Nitrate, Potassium Fluoride)	pH; EP Toxicity (Cr+6, Cd, Pb)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760
014	Waste acid solution from an aluminum hard coating operation. (Sulfuric and Oxalic Acid)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760
016	Waste acid from stainless steel pickle or pretreatment. (Hydrochloric Acid)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) EP Toxicity (D007).	Waste Hydrochloric Acid	UN1789
017	Waste solution from stripping cadmium plating. (Ammonium Nitrate)	EP Toxicity (Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006).	Waste Ammonium Nitrate Solution	NA2426
021	Waste acid from a stainless steel cleaning process. (Hydrofluoric and Sulfuric Acid)	рH	This solution is a Hazardous Waste due to Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760

MO ID NO.	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
022	Waste acid solution and sludge from various metal etching and cleaning. (Nitric, Chromic, Hydrofluoric Acids)	pH; EP Toxicity (Cr ⁺⁶ , Pb)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007, D008).	Waste Corrosive Liquid, N.O.S.	UN1760
023	Waste acid solution from metal surface passivation. (Nitric Acid)	pH	This solution is a Hazardous Waste due to Corrosivity (DOO2).	Waste Nitric Acid	UN2031
024	Waste alkaline solution from stripping of chromium plating. (Sodium Hydroxide, Sodium Carbonate, Sodium Phosphate, Chromium)	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Sodium Hydroxide Solution	UN1824
025	Waste alkaline solution from derust cleaning of metal parts. (Sodium Hydroxide, Triethanola-mine, Sodium Gluconate, Kerosene)	pH; EP Toxicity (Cr ⁺⁶)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Alkaline Liquid, N.O.S.	NA1719
026	Waste alkaline solution from cadmium cyanide plating operation. (Sodium Cyanide, Sodium Hydroxide, Cadmium Oxide, Sodium Carbonate)	EP Toxicity (Cd) (NaCN); Reacti- vity (Cyanide)	This solution is a Hazardous Waste due to EP Toxicity (D006) and Reactivity (D003).	Waste Corrosive Liquid, Poison, N.O.S.	UN2922
028	Waste potassium dichromate solu- tion from anodize sealing.	EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to EP Toxicity (D007).	Waste Corrosive Liquid, N.O.S.	UN1760

TABLE C-1

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MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
029	Waste alkaline cleaning solution from cleaning aluminum. (Sodium Tripolyphosphate, Sodium Borate, Sodium Nitrate, Sodium Chromate)	EP Toxicity (Cr ⁺⁶ , Pb)	This solution is a Hazardous Waste due to EP Toxicity (D007, D008).	Hazardous Waste, Liquid, N.O.S.	NA9189
031	Waste ferric chloride solution from metal etching.	pH; EP Toxicity (Cr+6)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007).	Waste Ferric Chloride Solution	UN2582
035	Waste alkaline solution from aluminum chemical milling.	EP Toxicity (Cr ⁺⁶); Reactivity (S ²)	This solution is a Hazardous Waste due to EP Toxicity (D007) and Reactivity (D003).	Waste Sodium Hydroxide Solution	UN1824
036	Sludge from industrial waste water pretreatment plant.	Listed Waste	This solution is a Hazardous Waste because it is a waste water treatment sludge from electroplating operations (F006) and aluminum chemical conversions (F019).	Hazardous Waste, Liquid, N.O.S.	NA9189
037	Water-emulsified cutting oil from cutting and machining aluminum, titanium and ferrous base metals and alloys.	Missouri Listed Waste	Contains more than 10% oil and is defined as Hazardous Waste by Missouri Regulation 10 CSR 25-4.020.	Not Regulated	Not Regulated
038	Solid hazardous waste from air- craft painting and servicing.	EP Toxicity (Pb)	This is a Hazardous Waste due to EP Toxicity (D008).	Hazardous Waste, Solid, N.O.S.	NA9189

MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT: ID NUMBER
039	Explosive devices which have exceeded their service lives or have been damaged so that they are not usable.	Explosive Devices DOT Classes "B" and "C"	This material is a Hazardous Waste due to Reactivity (D003).	Hazardous Waste, Solid, N.O.S.	NA9189
040	Waste paint sludge from aircraft and building maintenance.	EP Toxicity (Cr ⁺⁶)	This material is a Hazardous Waste due to EP Toxicity (D007).	Hazardous Waste, Solid, N.O.S.	NA9189
041	Waste chlorinated solvents from metal cleaning, degreasing operations, and paint stripping.	Trichloroethy- lene, methylene chloride, 1,1,1- trichloroethane (Listed Waste)	This material is a Hazardous Waste from nonspecific sources (F001, F002, D008).	Waste ORM-A, N.O.S.	NA1693
042	Waste jet fuel contaminated with water.	Flash Point	This waste is ignitable (D001).	Waste Flammable Liquid, N.O.S.	UN1993
043	Mixed waste solvents.	Acetone, xylene, toluene, methyl ethyl ketone (Listed Waste)	Flash Point; this waste is ignitable (D001) and a Hazardous Waste from nonspecific sources (F003, F005).	Waste Flammable Liquid, N.O.S.	UN1993
044	Waste hydraulic and motor oil.	Missouri Listed Waste	Contains more than 10% oil and is defined as Hazardous Waste by Missouri Regulation 10 CSR 25-4.020.	Hazardous Waste, Liquid, N.O.S.	NA9189
045	Waste coolant from metal cutting. (Triethanolamine, Sodium Nitrite, Potassium Chromate)	EP Toxicity (Cr ⁺⁶)	This solution is Hazardous Waste due to EP Toxicity (D007).	Hazardous Waste, Liquid, N.O.S.	NA9189

TABLE C-1

MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
049	Waste solution and sludge from developing x-ray film, photos, microfiche, and microfilm (Silver Sludge).	EP Toxicity (Ag)	This solution is a Hazardous Waste due to EP Toxicity (D011).	Hazardous Waste, Liquid, N.O.S.	NA9189
050	Empty containers which have contained hazardous waste.	Para. 261.33(C)	These containers have held a commercial chemical product listed in Para. 261.33(C) and have not been triple rinsed. MO Waste (MK13)		
052	Waste sodium bicarbonate or potassium hydroxide with phenol.	EP Toxicity (As, Cr ⁺⁶); pH	This solution is a Hazardous Waste due to EP Toxicity (D004, D007) and Corrosivity (D002).	Not Regulated	Not Regulated
053	Waste sodium bicarbonate used to neutralize an acid spill.	EP Toxicity (Cr ⁺⁶)	This is a Hazardous Waste due to EP Toxicity (D007).	Not Regulated	Not Regulated
054	Compressed gases.	Para. 261.33	These wastes are listed commercial chemical products (ignitable, corrosive, hazardous toxic).	•	
056	Waste acid solution for stripping nickel plating.	EP Toxicity (Cd, Cr ⁺⁶ , Pb)	This solution is Hazardous Waste due to EP Toxicity (D006, D007, D008).		UN1760
057	Sodium hydroxide solids from fume scrubber.	рН	This is a Hazardous Waste due to Corrosivity (D002).	Waste Corrosive Solids, N.O.S.	UN1759

MO ID NO.	HAZARDOUS WASTE	HAZARDOUS Parameter	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
059	Synthetic fuel (fuel oil, coal, and water).	Missouri Listed Waste	This is a Hazardous Waste because it contains more than 10% oil and is defined as Hazardous Waste by Missouri Regulation 10 CSR 25-4.020.	Not Regulated	Not Regulated
063	Lime	рН	This is a Hazardous Waste due to Corrosivity (D002).	Not Regulated	Not Regulated
069	Plating solution for ferrous and non-ferrous alloys (nickel sulfamate, boric acid).	EP Toxicity (Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006).	Hazardous Waste, Liquid, N.O.S.	NA9189
070	Phosphatizing of ferrous metal (phosphoric acid).	EP Toxicity (Cd, Pb); Reactivity (CN)	This solution is a Hazardous Waste due to EP Toxicity (D006, D008) and Reactivity (D003).	Waste Corrosive Liquid, N.O.S.	UN1760
075	Mold material for die-casting metals.	pH; EP Toxicity (As, Ba, Cd, Pb, Se)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D004, D005, D006, D008, D010).	Hazardous Waste, Liquid, N.O.S.	NA9189
080	Miscellaneous laboratory chemi- icals packed in a 55-gallon "lab pack".	EP Toxicity (As, Ba, Cd, Cr ⁺⁶ , Pb, Se, Ag); Reacti- vity (CN); pH; Flash Point	This is a Hazardous Waste due to EP Toxicity (D004, D005, D006, D007, D008, D009, D010, D011), Reactivity (D003), Ignitability (D001), and Corrosivity (D002).	Will vary with each drum and will be specified at the time of shipment.	Will vary

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	MO ID	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
	086	Metal treating solution in tooling manufacturing	рН	This solution is a Hazardous Waste due to Corrosivity (D002).	Waste Sodium Hydroxide Solution	UN1824
	880	Scale conditioner for exotic scales on metals	pH; Reactivity (CN)	This solution is a Hazardous Waste due to Corrosivity (D002, D003).	Hazardous Waste, Solid, N.O.S.	NA9189
	091	Miscellaneous acid sludges	pH; EP Toxicity (Cd, Cr ⁺⁶)	This sludge is Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D007 and D008).	Waste Corrosive Solids, N.O.S.	UN1759
	092	Miscellaneous alkaline sludges	pH; EP Toxicity; Reactivity (CN)	This sludge is Hazardous Waste due to Corrosivity (D002), EP Toxicity (D007, D008), and Reactivity (D003).	Waste Corrosive Solids, N.O.S.	UN1759
<u>R-</u>	2					R
	002	Laboratory scale plating bath	pH; Reactivity (CN)	This solution is a Hazardous Waste due to Corrosivity (D002, D003).	Hazardous Waste, Liquid, N.O.S.	NA9189
	004	Waste acid and rinse water from metal cleaning	pH	This solution is a Hazardous Waste due to Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
0	005	Excess paint removed from part racks	pH; EP Toxicity (Cr ⁺⁶ , Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006, D007) and Corrosivity (D002).	Waste Corrosive Liquid, N.O.S.	UN1760
	007	Laboratory spray operations	pH; EP Toxicity (Cd)	This solution is a Hazardous Waste due to Corrosivity (D002) and EP Toxicity (D006).	Waste Corrosive Liquid, N.O.S.	UN1760

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TABLE C-1

MO ID NO. R-2	HAZARDOUS WASTE	HAZARDOUS PARAMETER	RATIONALE	DOT PROPER SHIPPING NAME	DOT ID NUMBER
011	Laboratory reversal solution from photoetching	EP Toxicity (Cd)	This solution is a Hazardous Waste due to EP Toxicity (D006).	Hazardous Waste, Liquid, N.O.S.	NA9189
015	Laboratory scale indium plating solution	EP Toxicity (Hg); Reactivity (Cyanide)	This solution is a Hazardous Waste due to EP Toxicity (D009) and Reactivity (D003).	Hazardous Waste, Liquid, N.O.S.	NA9189

NOTE: Missing Missouri ID Numbers indicate that the waste is not being generated at this time, or is no longer classified as Hazardous Waste, or has been combined with another Missouri ID Number which was a similar waste.

TABLE C-2
PARAMETERS AND TEST METHODS

•				TABLE C-2 S AND TEST METHODS	_
		PARAMETER	TEST METHOD	REFERENCE	_
	1.	рH	Electrometric	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	
	2.	Flash Point	Pensky-Martens Closed-Cap Tester	ASTM Standard D-93-79 or D-93-80	
	3.	EP Toxicity	EP Toxicity Test Procedure	40 CFR 261, Appendix II	
	4.	Reactivity (Cyanide)	Distillation - Colori-metric	Standard Methods for the Examination of Water and Wastewater	
	5.	Reactivity (Sulfide)	Methylene Blue	Standard Methods for the Examination of Water and Wastewater	
	6.	Corrosivity	SAE 1020 Corrosion	National Association of Corrosion Engineers - Standard TM-01-69	
	7.	Arsenic	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	8.	Barium	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	9.	Cadmium	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	10.	Chromium (VI)	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	11.	Lead	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	12.	Mercury	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	13.	Selenium	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	14.	Silver	Atomic Absorption	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
	15.	Organics	Gas Chromatography	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), U.S. EPA, 1982	R
			1		

TABLE C-3

METHODS USED TO SAMPLE HAZARDOUS WASTES AND FREQUENCY OF ANALYSIS

MO ID	HAZARDOUS WASTE	ANAL YSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
001	Waste acid solu- tion from titanium metal surface cleaning. (nitric and chromic acid)	pH; EP Toxicity (Cr+6, Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
003	Waste acid solution from oxide removal on aluminum and titanium surfaces. (nitric acid, potassium dichromate, potassium nitrate, sodium biflouride)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

TABLE C-3

-	MO ID	HAZARDOUS WASTE	<u>ANAL YSIS</u>	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
	006	Waste acid and chlor- inated solvent from paint stripping. (hydrofluoric acid with phenol and methylene chloride)	pH; EP Toxicity (Cr ⁺⁶); Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
•	008	Waste acid solution from a chemical con- version coating process of aluminum and titanium surfaces. (chromic acid, fluor- ides, ferricyanide)	pH; EP Toxicity (Cr+6); Reactivity (Ferricyanide)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
009	Waste acid and chlor- inated solvent solution from a coating removal operation. (methylene chloride, formic acid, phenol)	pH; Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
010	Waste acid solution from aluminum metal surface cleaning. (sulfuric acid, sodium dichromate)	pH; EP Toxicity	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

 MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
012	Waste acid solution from cleaning and pickling aluminum and titanium. (nitric and hydrofluoric acid)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
013	Waste acid solution from chromic acid anodizing of aluminum and titanium. (chromic acid, ferric nitrate, potassium fluoride)	pH; EP Toxicity (Cr ⁺⁶ , Cd, Pb)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO II	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
014	Waste acid solution from an aluminum hard coating operation. (sulfuric and oxalic acid)	pH; EP Toxicity (Cr ⁺⁶)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
016	Waste acid from stainless steel pickle or pretreatment. (hydrochloric acid)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Naste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

TABLE C-3

METHODS USED TO SAMPLE HAZARDOUS WASTES AND FREQUENCY OF ANALYSIS

MO ID	HAZARDOUS WASTE	ANAL YSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
001	Waste acid solu- tion from titanium metal surface cleaning. (nitric and chromic acid)	pH; EP Toxicity (Cr+6, Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
003	Waste acid solution from oxide removal on aluminum and titanium surfaces. (nitric acid, potassium dichromate, potassium nitrate, sodium biflouride)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

TABLE C-3

-	MO ID	HAZARDOUS WASTE	<u>ANAL YSIS</u>	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
	006	Waste acid and chlor- inated solvent from paint stripping. (hydrofluoric acid with phenol and methylene chloride)	pH; EP Toxicity (Cr ⁺⁶); Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
•	008	Waste acid solution from a chemical con- version coating process of aluminum and titanium surfaces. (chromic acid, fluor- ides, ferricyanide)	pH; EP Toxicity (Cr+6); Reactivity (Ferricyanide)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
009	Waste acid and chlor- inated solvent solution from a coating removal operation. (methylene chloride, formic acid, phenol)	pH; Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
010	Waste acid solution from aluminum metal surface cleaning. (sulfuric acid, sodium dichromate)	pH; EP Toxicity	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
017	Waste solution from stripping cadmium plating. (ammonium nitrate)	EP Toxicity (Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
021	Waste acid from a stainless steel cleaning process. (hydrofluoric and sulfuric acid)	pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
017	Waste solution from stripping cadmium plating. (ammonium nitrate)	EP Toxicity (Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
021	Waste acid from a stainless steel cleaning process. (hydrofluoric and sulfuric acid)	pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
022	Waste acid solution and sludge from various metal etching and cleaning. (nitric, chromic, and hydrofluoric acid)	pH; EP Toxicity (Cr+6, Pb)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Waste, Physical/ Chemical Methods, EPA-SW-846
023	Waste acid solution from metal surface passivation. (nitric acid)	рН	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
024	Waste alkaline solution from stripping of chromium plating. (sodium hydroxide, sodium carbonate, sodium phosphate, chromium)	pH; EP Toxicity (Cr ⁺ 6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
025	Waste alkaline solution derust cleaning of metal parts. (sodium hydroxide, triethanolamine, sodium gluconate, kerosene)	pH; EP Toxicity (Cr+6, Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

TABLE C-3

METHODS USED TO SAMPLE HAZARDOUS WASTES AND FREQUENCY OF ANALYSIS

MO ID	HAZARDOUS WASTE	ANAL YSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
001	Waste acid solu- tion from titanium metal surface cleaning. (nitric and chromic acid)	pH; EP Toxicity (Cr+6, Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
003	Waste acid solution from oxide removal on aluminum and titanium surfaces. (nitric acid, potassium dichromate, potassium nitrate, sodium biflouride)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

TABLE C-3

-	MO ID	HAZARDOUS WASTE	<u>ANAL YSIS</u>	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
	006	Waste acid and chlor- inated solvent from paint stripping. (hydrofluoric acid with phenol and methylene chloride)	pH; EP Toxicity (Cr ⁺⁶); Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
•	008	Waste acid solution from a chemical con- version coating process of aluminum and titanium surfaces. (chromic acid, fluor- ides, ferricyanide)	pH; EP Toxicity (Cr+6); Reactivity (Ferricyanide)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
009	Waste acid and chlor- inated solvent solution from a coating removal operation. (methylene chloride, formic acid, phenol)	pH; Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
010	Waste acid solution from aluminum metal surface cleaning. (sulfuric acid, sodium dichromate)	pH; EP Toxicity	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

 MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
012	Waste acid solution from cleaning and pickling aluminum and titanium. (nitric and hydrofluoric acid)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
013	Waste acid solution from chromic acid anodizing of aluminum and titanium. (chromic acid, ferric nitrate, potassium fluoride)	pH; EP Toxicity (Cr ⁺⁶ , Cd, Pb)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
014	Waste acid solution from an aluminum hard coating operation. (sulfuric and oxalic acid)	pH; EP Toxicity (Cr ⁺⁶)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
016	Waste acid from stainless steel pickle or pretreat- ment. (hydrochloric acid)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

TABLE C-3

METHODS USED TO SAMPLE HAZARDOUS WASTES AND FREQUENCY OF ANALYSIS

MO ID	HAZARDOUS WASTE	ANAL YSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
001	Waste acid solu- tion from titanium metal surface cleaning. (nitric and chromic acid)	pH; EP Toxicity (Cr+6, Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
003	Waste acid solution from oxide removal on aluminum and titanium surfaces. (nitric acid, potassium dichromate, potassium nitrate, sodium biflouride)	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

TABLE C-3

-	MO ID	HAZARDOUS WASTE	<u>ANAL YSIS</u>	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
	006	Waste acid and chlor- inated solvent from paint stripping. (hydrofluoric acid with phenol and methylene chloride)	pH; EP Toxicity (Cr ⁺⁶); Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.		Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
•	008	Waste acid solution from a chemical con- version coating process of aluminum and titanium surfaces. (chromic acid, fluor- ides, ferricyanide)	pH; EP Toxicity (Cr+6); Reactivity (Ferricyanide)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
009	Waste acid and chlor- inated solvent solution from a coating removal operation. (methylene chloride, formic acid, phenol)	pH; Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
010	Waste acid solution from aluminum metal surface cleaning. (sulfuric acid, sodium dichromate)	pH; EP Toxicity	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
017	Waste solution from stripping cadmium plating. (ammonium nitrate)	EP Toxicity (Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
021	Waste acid from a stainless steel cleaning process. (hydrofluoric and sulfuric acid)	pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
017	Waste solution from stripping cadmium plating. (ammonium nitrate)	EP Toxicity (Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
021	Waste acid from a stainless steel cleaning process. (hydrofluoric and sulfuric acid)	pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

	ID 0.	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
0	22	Waste acid solution and sludge from various metal etching and cleaning. (nitric, chromic, and hydrofluoric acid)	pH; EP Toxicity (Cr+6, Pb)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
0	23	Waste acid solution from metal surface passivation. (nitric acid)	pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
024	Waste alkaline solution from stripping of chromium plating. (sodium hydroxide, sodium carbonate, sodium phosphate, chromium)	pH; EP Toxicity (Cr ⁺ 6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
025	Waste alkaline solution derust cleaning of metal parts. (sodium hydroxide, triethanolamine, sodium gluconate, kerosene)	pH; EP Toxicity (Cr+6, Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
026	Waste alkaline solution from cadmium cyanide plating operation. (sodium cyanide, sodium hydroxide, cadmium oxide, sodium carbonate)	EP Toxicity (Cd, NaCN)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
028	Waste potassium dichromate solution from anodize sealing.	EP Toxicity (Cr ⁺⁶)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
026	Waste alkaline solution from cadmium cyanide plating operation. (sodium cyanide, sodium hydroxide, cadmium oxide, sodium carbonate)	EP Toxicity (Cd, NaCN)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
028	Waste potassium dichromate solution from anodize sealing.	EP Toxicity (Cr ⁺⁶)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

×	MO ID NO. 029	HAZARDOUS WASTE Waste alkaline cleaning solution from cleaning aluminum. (sodium tripolyphosphate, sodium borate, sodium nitrate, sodium chromate)	ANALYSIS EP Toxicity (Cr ⁺⁶ , Pb)	FREQUENCY Each time a removal is made, but not to exceed one sample in a 12-month period.	SAMPLING METHOD Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	DESCRIPTION OF SAMPLING A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	REFERENCE FOR SAMPLER Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
	031	Waste ferric chloride solution from metal etching.	pH; EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

O ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPL ING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
035	Waste alkaline solution from aluminum chemical milling.	EP Toxicity (Cr ⁺⁶); Reactivity (S-2)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
036	Sludge from industrial waste water pretreatment plant.	Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Solid waste samples from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Page 11.	Composite sample using a trier scoop from six points in a nine cubic yard container.	Test Methods for the Evaluation of Solid Waste, Physical/ Chemical Methods, EPA-SW-846

MO ID NO.	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
037	Water-emulsified cutting oil from cutting and machining aluminum, titanium, and ferrous base metals and alloys.	Missouri Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
038	Solid hazardous waste from aircraft painting and servicing.	EP Toxicity (Pb)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Solid waste samplers from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 12 and 13.	Composite sample using a scoop from containers of solid waste.	Test Methods for the Evaluation of Solid Waste, Physical/ Chemical Methods, EPA-SW-846
039	Explosive devices which have exceeded their service lives or have been damaged so that they are not usable.	Explosive Devices DOT Classes "B" and "C"				

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
040	Waste paint sludge from aircraft and building maintenance.	EP Toxicity (Cr+6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Solid waste sam- plers from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 12 and 13.	•	Test Methods for the Evaluation of Solid Waste, Physical/ Chemical Methods, EPA-SW-846
041	Waste chlorinated solvents from metal cleaning and degreasing operations and paint stripping.	Trichloroethy- lene, methylene chloride, 1,1,1- trichloroethane (Listed Waste)	Each time a removal is made, but not to exteed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
042	Waste jet fuel contaminated with water.	Flash Point	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
043	Mixed waste solvents.	Acetone, xylene, toluene, methyl ethyl ketone (Listed Waste)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

i Ste get g	MO ID NO. 044	HAZARDOUS WASTE Waste hydraulic and motor oil.	ANALYSIS Missouri Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	DESCRIPTION OF SAMPLING A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	REFERENCE FOR SAMPLER Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
e:	045	Waste coolant from metal cutting. (triethanolamine, sodium nitrite, potassium chromate)	EP Toxicity (Cr ⁺⁶)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

 MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
049	Waste solution and sludge from developing x-ray film, photos, microfiche, and microfilm. (silver sludge)	EP Toxicity (Ag)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846.
050	Empty containers which have contained hazardous waste.	Par. 261.33(c)				
052	Waste sodium bicarbonate or potassium hydroxide with phenol.	EP Toxicity (As, Cr ⁺⁶); pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
053	Waste sodium bicarbonate used to neutralize an acid spill.	EP Toxicity (Cr ⁺⁶)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Solid waste samplers from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 12 and 13.	Composite sample using a scoop.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
054	Compressed gases.	Par. 261.33			:	*
056	Waste acid solution for stripping nickel plating.	EP Toxicity (Cd, Cr ⁺⁶ , Pb)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
057	Sodium hydroxide solids from fume scrubber.	pH **	Each time a removal is made, but not to exceed one sample in a 12-month period.	Solid waste sam- plers from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 12 and 13.	Composite sample using a scoop.	Test Methods for the Evaluation of Solid Waste, Physical/ Chemical Methods, EPA-SW-846
059	Synthetic fuel. (fuel oil, coal, and water)	Missouri Listed Waste	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/ 2-80-018, Pages 36 and 38.	A representative sample from a drum or tank, using a scoop.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
063	Lime	pН	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Proce- dures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	Representative composite sample from three grab samples, using a grain sampler or a Trier scoop.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

	MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
5115	069	Plating solution for ferrous and non-ferrous alloys. (nickel sulfamate, boric acid)	EP Toxicity (Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
	070	Phosphatizing of ferrous metal. (phosphoric acid)	EP Toxicity (Cd, Pb); Reactivity (CN)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

	O ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
1	075	Mold material for die-casting metals.	pH; EP Toxicity (As, Ba, Cd, Pb, Se)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
1	080	Miscellaneous laboratory chemicals packed in a 55- gallon "lab pack".	EP Toxicity (As, Ba, Cd, Cr+6, Pb, Se, Ag); Reactivity (CN); Flash Point; pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

DATE: 09 SEP 83 REVISION NO.: 1 (C)

TABLE C-3

MO ID NO.	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
082 -	Pickling solution for aluminum alloys. (nitric acid, hydro-fluoric acid, sulfuric acid)	pH; EP Toxicity (Cd, Cr ⁺ 6)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
086	Metal treating solution in tooling manufacturing.	pH	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of the tank.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

DATE: 09 SEP 83 REVISION NO.: 1 (C)

TABLE C-3

MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
088	Scale conditioner for exotic scales on metals.	pH; Reactivity (CN)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA- 600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank, using a Trier scoop.	Test Methods for the Evaluation of Solid Waste, Physical/ Chemical Methods, EPA-SW-846
091	Miscellaneous acid sludges.	pH; EP Toxicity (Cd, Cr ⁺⁶ , Pb)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank, using a Trier scoop.	Test Methods for the Evaluation of Solid Waste, Physical/ Chemical Methods, EPA-SW-846
092	Miscellaneous alkaline sludges.	pH; EP Toxicity; Reactivity (CN)	Each time a removal is made, but not to exceed one sample in a 12-month period.	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams", EPA-600/2-80-018, Pages 36 and 38.	A representative sample from a drum or a tank, using a Trier scoop.	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

DATE: 09 MAY 84 REVISION NO.: (C)

TABLE C-3

METHODS USED TO SAMPLE HAZARDOUS WASTES AND FREQUENCY OF ANALYSIS

MO ID NO. R-2	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
002	Laboratory scale plating bath	pH; Reactivity (CN)	Each time a removal is made, but not to exceed one sample in a 12-month period	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/ 2-80-018, Pages 36 and 38	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of tank	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
004	Waste acid and rinse water from metal cleaning	рH	Each time a removal is made, but not to exceed one sample in a 12-month period	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/ 2-80-018, Pages 36 and 38	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of tank	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

DATE: 09 MAY 8/ REVISION NO.: (C)

TABLE C-3

MO ID NO.	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
005	Excess paint removed from part racks	pH; EP Toxicity (Cr ⁺⁶ , Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/ 2-80-018, Pages 36 and 38	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of tank	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
007	Laboratory spray operations	pH; EP Toxicity (Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/ 2-80-018, Pages 36 and 38	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of tank	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

DATE: 09 MAY 84 REVISION NO.:

TABLE C-3

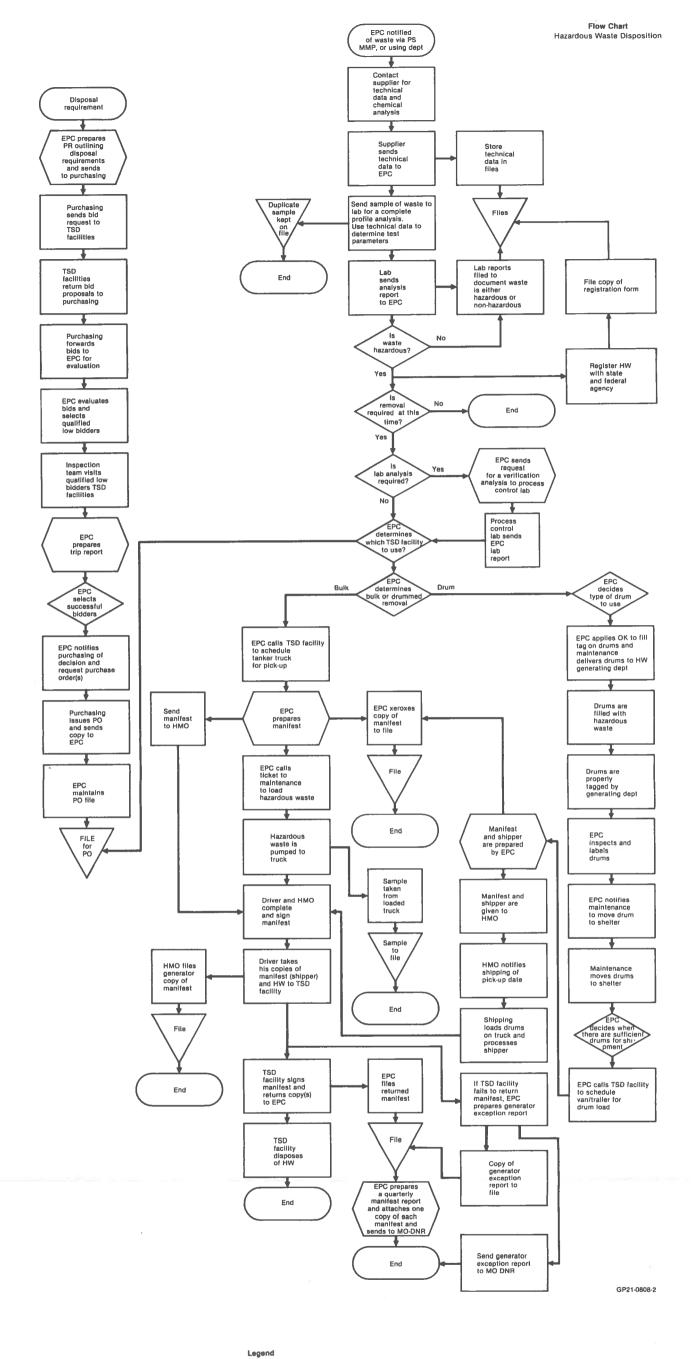
MO ID	HAZARDOUS WASTE	ANALYSIS	FREQUENCY	SAMPLING METHOD	DESCRIPTION OF SAMPLING	REFERENCE FOR SAMPLER
011	Laboratory reversal solution from photoetching	EP Toxicity (Cd)	Each time a removal is made, but not to exceed one sample in a 12-month period	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/ 2-80-018, Pages 36 and 38	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of tank	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846
015	Laboratory scale indium plating solution	EP Toxicity (Hg); Reactivity (CN)	Each time a removal is made, but not to exceed one sample in a 12-month period	Sampling a drum or storage tank from "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/ 2-80-018, Pages 36 and 38	A representative sample from a drum or a tank less than four feet deep using a coliwasa, or a composite sample from a tank deeper than four feet using a weighted bottle to grab samples at the top, middle, and bottom of tank	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA-SW-846

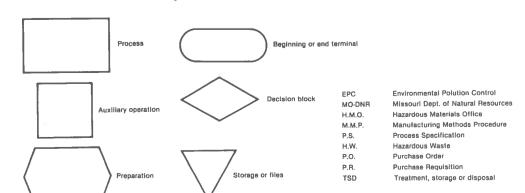
DATE: 09 MAY 84 REVISION NO.: 2 (C)

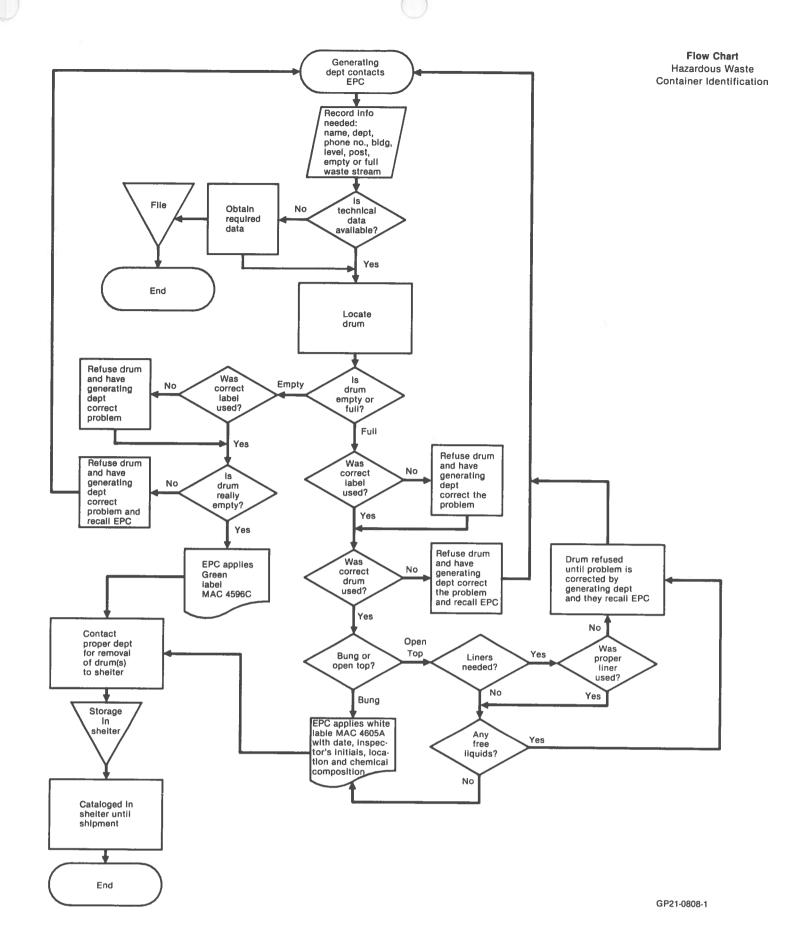
Due to consolidation of waste streams during Missouri Department of Natural Resources' requested reregistration, this Section (C) has reduced in size.

R-2

This single page constitutes Pages C-45 through C-60.







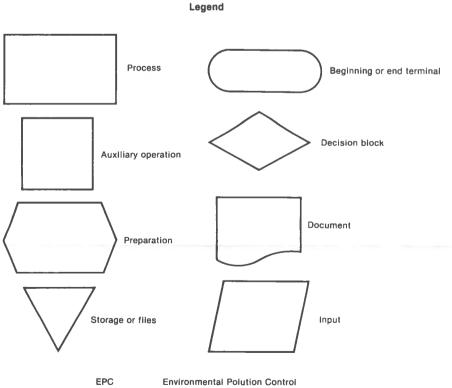


FIGURE C-2 PAGE 62

EPC Environmental Polution Control
MO-DNR Missouri Dept. of Natural Resources
H.M.O. Hazardous Materials Office
M.M.P. Manufacturing Methods Procedure
P.S. Process Specification
H.W. Hazardous Waste
P.O. Purchase Order
P.R. Purchase Requisition

TSD

Treatment, storage or disposal

REQUEST FOR LABORATORY ANALYSIS DEPT 191

REMARKS:

SAMPLE IDENTIFICATION:



General Testing Laboratories, Inc.

Engineering — Chemical Consultants





	Date July 14, 198		•	Number	38413-22
	Sample of Vergo Heat Treat				
	MarkedSample No. Circle		_	P.O.#F03	25250
•	Client McDonnell Douglas	-	•		
		Total as	Received	EP Toxio	ity *
	Arsenic Barium Cadmium Chromium (III) Chromium (VI) Copper Cyanide (total) Lead Mercury Nickel Selenium Silver Zinc	2,058 ppm less than 15 ppm 124 ppm	0.5 .ppm	less tha 0.17 mg/1 22 mg/li 1.7 mg/l 0.14 mg/ 0.20 mg/less tha 0.33 mg/less tha 0.06 mg/0.02 mg/	ter iter 'liter 'liter n 0.2 ug/liter 'liter in 5.0 ug/liter 'liter
1	* EP Toxicity (Leachate) Fe May 19, 1980 and Vol. 45, N	deral Regi o. 212/Thu	ster/Vol. 45, N rsday, October	o. 98/Men 30, 1980.	iday,
	pH	w 590	12.8		
	Specific Gravity @ 60 °F.	•	1.093 gm/cc		gir Tierra
	Per Cent by Weight Volatile	s@ :			• 0 ,
	10	o °c.	2.50 %		· · · · · · · · · · · · · · · · · · ·
	60	0 °C.	3.51 %		a (4)
	Characteristics of Ignitabi	lity	Not ignitable		
	Characteristics of Corrosiv	ity	0.0013 inches/	year	
	Characteristics of Reactivi	ty:		F)	
	Cyanid	es	0.016 %		
	Sulfid	es	None GENERAL TESTING I	_ABORATORI	ES, INC.

(1)gs

Figure C-4 Page 64 Form 1108



General Testing Laboratories, Inc.

Engineering — Chemical Consultants





	Date	July 14	•	198 1	118	رو N	umber 38413-	25
					Cadmium Ond	le, Sodium	Hydroxide,	Sodium
		Sample					, Ca	rbonate
				las Corp.			P.O.#F0353	5C
	Client	TIC DOTTITE	II DOUG		s Received	EP	Toxicity *	
								/1:tom
	Arsenic Barium Cadmium Chromium Chromium Copper	(VI)		13 ppm 266 ppm 49,965 1,990 p 6.5 ppm 629 ppm	n ppm n	0.: 0.: 0.:	ss than 5.0 15 mg/liter 50 mg/liter 65 mg/liter 13 mg/liter mg/liter	11
	Cyanide (Lead Mercury Nickel Selenium Silver Zinc	LOCAL)		556 ppm 1ess th 581 ppm	nan 0.01 ppm n nan 0.5 ppm n	1 es 17 1es 0.	25 mg/literss than 0.2 mg/literss than 5.0 l2 mg/liter04 mg/liter	ug/liter
	* EP Tox May 19, 1	icity (L 980 and	eachate Vol. 45) Federal I , No. 212/7	Register/Vol Thursday, Oc	L. 45, No. tober 30,	98/Monday, 1980.	*
	pН			•	9.6			
	Specific	Gravity	@ 60 °F	•	0.921 gu	n/cc	. 86	
	Per Cent	by Weigh	t Volat	iles @				
		•		100 °C.	22.26 %			
				600 °C.	38.51 %		. •	
	Character	istics o	of Ignit	ability	Not igni	itable		
	Character					nches/year	• 🗑	. •
	Character							
	olia lacter		Су	anides	0.44 % None			·
						TESTING LABO	PATORIES, INC.	
	(1)gs			1	Ву			· .
-				Figure C- Page 65	Special States and address of the		Form 11	0B

SLUDGE



General Testing Laboratories, Inc.

Engineering — Chemical Consultants





Date	July 14, 1	98_1	outte	Number <u>384</u>	13-25
Sample of	Sludge - Sodium	Cyanide, C	admium Ohde,	Sodium Hydroxio	ie, Sodium
Marked	Sample No. K-26	-S	(27)		Carbonate
Client	McDonnell Dougla	as Corp.		P.O.#F03	3535C
		Total as	Received	EP Toxicity	, ÷
Arsenic Barium Cadmium Chromium Chromium Copper Cyanide ((VI)	13 ppm 266 ppm 49,965 pp 1,990 ppm 6.5 ppm 629 ppm	m o	less than 5 0.15 mg/lit 0.50 mg/lit 0.65 mg/lit 0.13 mg/lit 23 mg/liter	er Eer Eer
Lead Mercury Nickel Selenium Silver Zinc		581 ppm	n 0.01 ppm n 0.5 ppm	17 mg/liter	0.2 ug/liter : 6.0 ug/liter :er
* EP Tox: May 19, 19	icity (Leachate) 980 and Vol. 45,	Federal Reg No. 212/Thu	gister/Vol. 4	45, No. 98/Monda per 30, 1980.	У,
pН			9.6		
Specific (Gravity @ 60 °F.		0.921 gm/cc	<i>≅</i> −	
Per Cent 1	by Weight Volatil	.es @ .	• 2	®	
	· 1	00 °C.	22.26 %		
	6	00 °C.	38.51 %		•
Characteri	istics of Ignitab	ility	Not ignitab	ole	
Characteri	istics of Corrosi	vity	0.013 inche	es/year	
Characteri	istics of Reactiv	ity		* .	
	Cyan	ides	0.44 %		. =
e e	Sulf	ides	None GENERAL TEST	ING LABORATORIES, IN	· 10
			deivenat 1821	ING LABORATURIES, IN	. .
(1)gs			Ву		
				-	

ANN VICAL - CHEMICTON	RESEARCH-FIELD STUDIES	

3278 NO. LINDBERGH FLORISSANT, MO. 63033

Figure

C-7,

Page

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PHONE 1-314-921-4488

ENVIRONMENTAL ANALYSIS INC.

Date: 9-1-82
Report No. 10321
Lab No. 245-10
P.O. No. G-1A240-C

Mr. J. C. Patterson McDONNELL DOUGLAS CORP. Post Office Box 516 Dept. 191C; Bldg. 102 St. Louis, MO 63166

REPORT OF ANALYSIS

Subject: Analysis of waste samples performed in accordance with the Resource Conservation and Recovery Act 40 C F R; 261.21 - Characteristic of Ignitability; 261.22 - Characteristic of Corrosivity; 261.24 - Characteristic of EP Toxicity; and 261.23 - Characteristic of Reactivity.

Sample Identification:
#1 - No. 3266 RJL, JP-4 Fuel, Waste, Fuel Pit #3,
Underground Accumulation Tank, submitted 10 Aug 82.

Results of Analysis:

Ignitability, Test Method No.	261.21
Plash Point (P-M), F	118
Corrosivity, Test Method No.	261.22
pH Value, pH Units	7.18
EP Toxicity, Test Method No.	261.24
Arsenic, mg As/l	0.003
Barium, mg Ba/l	0.31
Cadmium, mg Cd/l	0.002
Chromium (hex.), mg Cr/l	<0.12

ANALYTICAL-CHEMISTRY-RESEARCH-FIELD STUDIES

3278	NO.	LIND	BER	GH
FLO	RISS	ANT.	MO.	6303

ENVIRONMENTAL ANALYSIS

	INC.
Results of Analysis:	
	# 1
Lead, mg Pb/l	0.02
Mercury, mg Hg/l	<0.005
Selenium, mg Se/l	<0.01
Silver, mg Ag/l	0.002
Tests on Sample as received	-
Volatiles @ 100 C, % w/w	99.82
Volatiles @ 600 C, % w/w	99.98
BTU Value, DTU/1b	3097
Specific Gravity, 0 60 F	0.997
Chromium (total), mg Cr/l	0.032
Lead (total), mg Pb/1	0.15
Total Metals Prep.	1
Reactivity, Test Method No.	261.23
Cyanide (total), mg CN/l	0.100
Sulfide, (total) mg S/l	0.8
Does sample react with H2O?	No

ANALYTICAL -	CHEMISTRY_	RESEARCH_	FIELD	STUDIES

3278 NO. LINDBERGH FLORISSANT, MO. 63033

Figure

C-8,

Page

89

PHONE 1-314-921-4488 3278 NO. LINDBERGH FLORISSANT. MO. 63033 ANALYTICAL-CHEMISTRY-RESEARCH-FIELD STUDIES

ENVIRONMENTAL

261.23

0.075

1.6

PHONE 1-314-921-4468

ENVIRONMENTAL. ANALYSIS INC.

Date: 9-3-82 Report No. 10331 Lab No. 245-08 P.O. No. G-1A240-C

Mr. J. C. Patterson McDONNELL DOUGLAS CORP. Post Office Box 516 Dept. 191C; Bldg. 102 St. Louis, MO 63166

REPORT OF ANALYSIS

Subject: Analysis of waste samples performed in accordance with the Resource Conservation and Recovery Act 40 C F R; 261.21 - Characteristic of Ignitability; 261.22 - Characteristic of Corrosivity; 261.24 - Characteristic of EP Toxicity and 261.23 - Characteristic of Reactivity.

Sample Identification:

11 - Sample No. 3264 RJL, Hush House Oil Separator Accumulation Tank for Waste JP-4 and Oil, submitted 11 Aug 82.

Results of Analysis:

Ignitability, Test Method No.	# 1 261.21
Flash Point (P-M), F	38
Corrosivity, Test Method No.	261.22
pH Value, pH Units	9.03
EP Toxicity, Test Method No.	261.24
Arsenic, mg As/l	0.020
Barium, mg Ba/l	4.40
Cadmium, mg Cd/1	0.042
Chromium (hex.), mg Cr/l	<0.12

Results of Analysis:	ANALYSIS INC.	16
	# 1	
Lead, mg Pb/l	0.49	
Mercury, mg Hg/l	<0.005	
Selenium, mg Se/l	<0.01	
Silver, mg Ag/l	0.004	
Tests on Sample as rece	eived -	
Volatiles @ 100 C, % w/	/w 64.97	
Volatiles @ 600 C, % w/	/w 99.97	
BTU Value, BTU/1b	19479	
Specific Gravity, @ 60	F 0.798	
Cadmium, mg Cd/1	0.117	
Chromium (total), mg Cr	r/l 0.239	
Lead, mg Pb/l	1.14	
Phenols, mg Phenol/l	20.5	
Total Metals Prep.	1	

Reactivity, Test Method No.

Does sample react with H2O?

Cyanide (total), mg CN/1

Sulfide, (total) mg S/1

	ANALYTICAL-CHEM	IISTAY-RESEARCH-FIELD STUDIES	k.	
3278 NO. LINDBERG FLORISSANT, MO. 6	3033 ENV	RONMENTAL, INALYSIS INC.		ONE 21-4488
McDONNE Post Of Dept. 1	C. Patterson LL DOUGLAS CORP. fice Box 516 91C; Bldg. 102 is, MO 63166	•	Date: Report No. Lab No. P.O. No.	9-3-82 10342 245-09 G-1A240-C
Figure C-9, Pag	: Analysis of waste sa the Resource Conserv 261.23 - Characteris Characteristic of Co of EP Toxicity; and	omples performed in a vation and Recovery A stic of Reactivity; 2 orrosivity; 261.24 - Standard Methods for other, 15th Edition, 1	ct 40 C F R 61.22 - Characterist the Examina	; tic
O Sample		Chrome Strip Solution	n from 8 dr	ums, 11 Aug 82.
Results	of Analysis:		•	
	vity, Test Method No.	# 1 261.22 9.07		
-	city, Test Method No.	3 3		

0.002

0.05

14.0

0.072

1.70

<0.005

<0.01

Arsenic, mg As/l

Barium, mg Ba/l

Cadmium, mg Cd/l

Mercury, mg Hg/l

Selenium, mg Se/l

Lead, mg Pb/l

Chromium (hex.), mg Cr/l

ANALYTICAL-CHEMISTRY-RESEARCH-FIELD STUDIES

3278 NO. LINDBERGH FLORISSANT, MO. 63033

ENVIRONMENTAL ANALYSIS INC.

TAL 1-314-921-4426

PHONE

Results of Analysis:

Silver, mg Ag/l	# 1 0.006
Tests on Sample as received	-
Volatiles @ 100 C, % w/w	70.74
Volatiles @ 600 C, % w/w	77.95
Specific Gravity, 0 60 F	1.223
Chromium (hex.), mg Cr/l	23.5
Chromium (total), mg Cr/l	213
Copper, mg Cu/l	121
Nitrate Nitrogen, mg N/1	62000
Sodium, mg Na/1	148300
Total Metals Prep.	1
Reactivity, Test Method No.	261.23
Cyanide (total), mg CN/l	0.225
Sulfide, (total) mg S/1	<0.4
Does sample react with H2O?	No

.

HAZARDOUS WASTE CHEMICAL ANALYSIS

DATE REQUESTED _____

EPARTMENT	BUILDING/LOCATION	·
	ORIGINAL	
	OR IDENTIFICATION	
ONLY ITEMS CHECKED		
SPECIFIC GRAVITY		
٦ (4
, '	·	•
-	CE)	
-	00 °C	
7	00 °C	
7	.1 9	•
-		
_		•
CYANIDE AS	υ 	BY WT CN
	15	
HYDRO FLUORIC ACID AS	•	% BY WT HF
NITRIC ACID AS	and the second s	
¬	9	•
ORGANIC CHLORIDES AS _		mg/1 OR % BY WT C1-
1	•	
TOTAL CHROMIUM		mg/1
INORGANIC CHLORIDES	···	% BY WT C1-
INORGANIC FLUORIDES		% BY WT F -
INORGANIC NITRATES		% BY WT NO ₃ -
INORGANIC PHOSPHATES		% BY WT PO 4 3
INORGANIC SULFATES		% BY WT SO ₄ -2
SULFURIC ACID AS		% BY WT H₂ SO₄
BY	EMPL	OYE NO. "

HAZAR		TE
MATERIAL NAME:		
STATEMENTS OF HAZAR	D:	
PREPARED BY:	DEPT.	DATE
USE SOFT LEAD PENCIL TO FILL OUT F	ORM	

MCDONNELL DOUGLAS CORPORATION BOX SIG. SAINT LOUIS MISSOURI, 63166

	mulul		RK ORDER NO		
☐ ELECTRICA	L MAINTENAN	CE			
BUILDING M	AINTENANCE			MECHANICAL M	
OREMAN			DATE	IR CONDITION	
DEPT. NO.	CATION				SHIFT 1 2 3
REQUESTED BY			TEL. NO.		BLDG.
MACHINE			F.	O. NUMBER	
			MACHINE	NO.	
ROUBLE					
				72 1 10 10 10	
RK PERFORME	D *				
RECOR	RD DATA BEI	OW AT FND	05 5460		
RECOR	PD DATA BEL		OF EACH WO	RK SHIFT	
RECOR	RD DATA BEL	OW AT END	OF EACH WO	RK SHIFT	1 HOURS
RECOR					HOURS
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RECOR					HOURS
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NAME					HOURS
RECORD	DATE		NAME	DATE	
NAME	DATE	HOURS	NAME		LETED

DATE: 09 SEP 83 REVISION NO.: 1

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SECTION D

PROCESS INFORMATION

The information provided in this section is submitted in accordance with the requirements of 40 CFR Part 122.25(b)(1), (2), and (4) and 10 CSR 25-7.030(3) and 7.050(3) and (4). Other regulations addressed to complete this section include 40 CFR §264.17, §264.175, §264.176, §264.177, §264.191, §264.192, §264.198, §264.199, §264.252, §264.253, §264.256, and §264.257.

This section discusses specific process information for the storage of containers and tanks. McDonnell Douglas Corporation - St. Louis (MDC-St. Louis) stores hazardous wastes at this facility in 55-gallon drum containers, underground, inground, and above-ground tanks and a containerized explosive storage building. The capability of these areas are as follows:

- I) Containers 37,620 gallons;
- II) Two 10,000-gallon above-ground tanks;
- III) Five 500-gallon above-ground tanks;
- IV) Six 750-gallon above-ground tanks;
- V) One 3,380-gallon below-ground tank;
- VI) Two 2,000-gallon below-ground tanks;
- VII) One 2,000-gallon below-ground tank;
- VIII) One 5,000-gallon below-ground tank;
 - IX) One 1,000-gallon below-ground tank;
 - X) One 120,000-gallon inground tank;
 - XI) One Explosive Storage Building, 30,300 gallons, containerized;
- XII) One 4,380-gallon below-ground tank.

These storage area designs were all certified by a registered Professional Engineer.

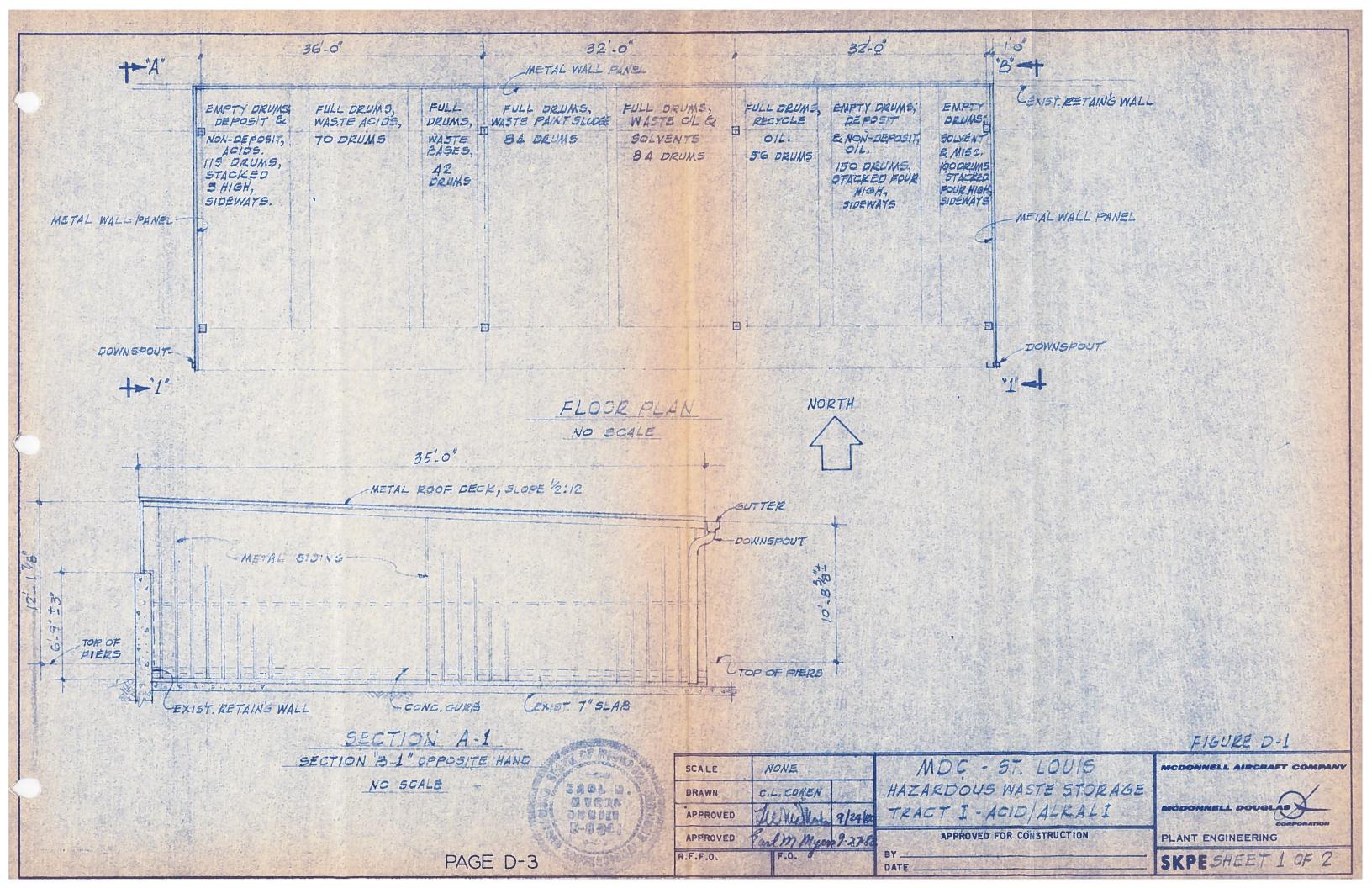
D-1 Containers [40 CFR 122.25(b)(1)] and [10 CSR 25-7.050(3)]

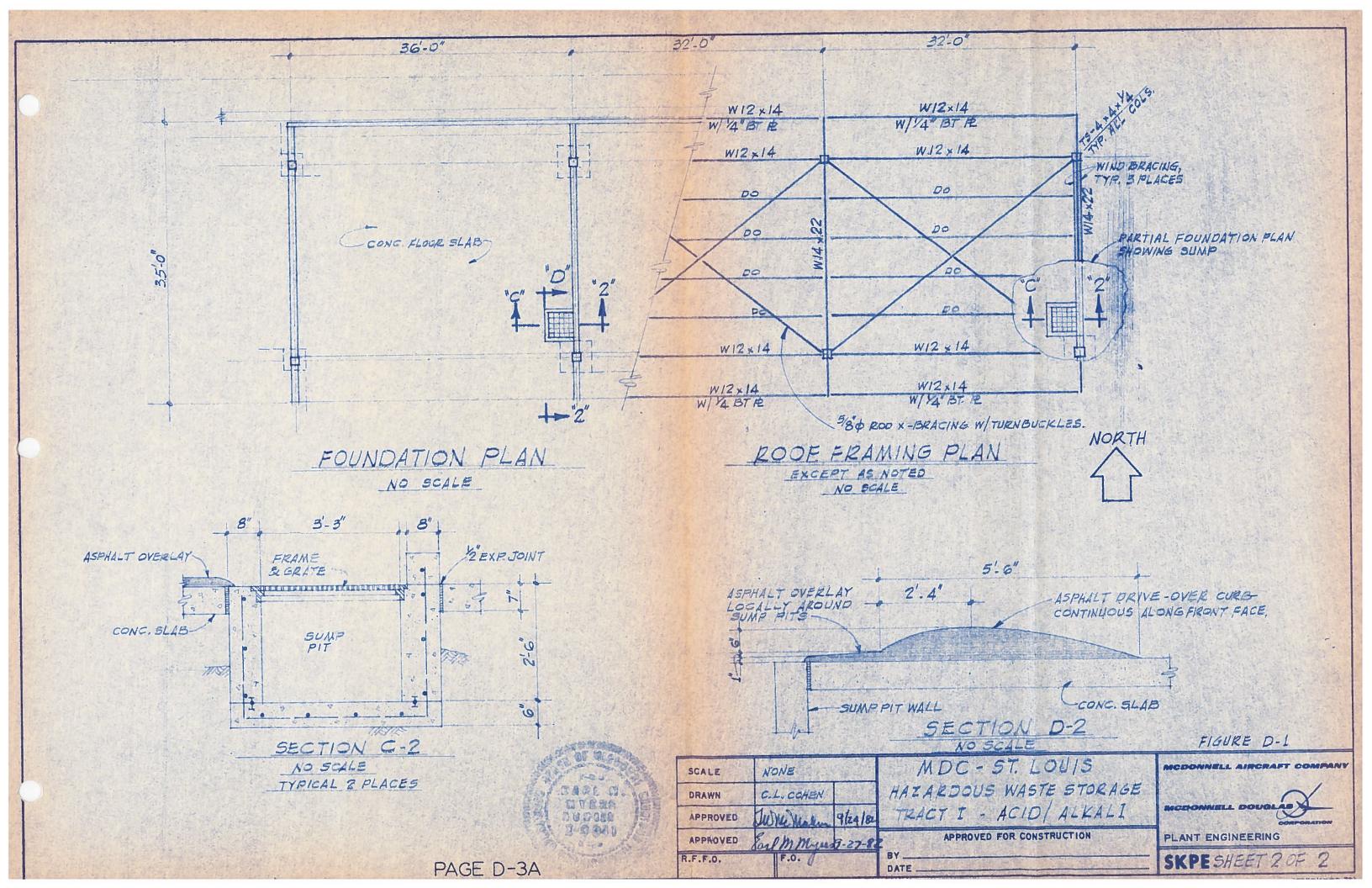
D-la Containers

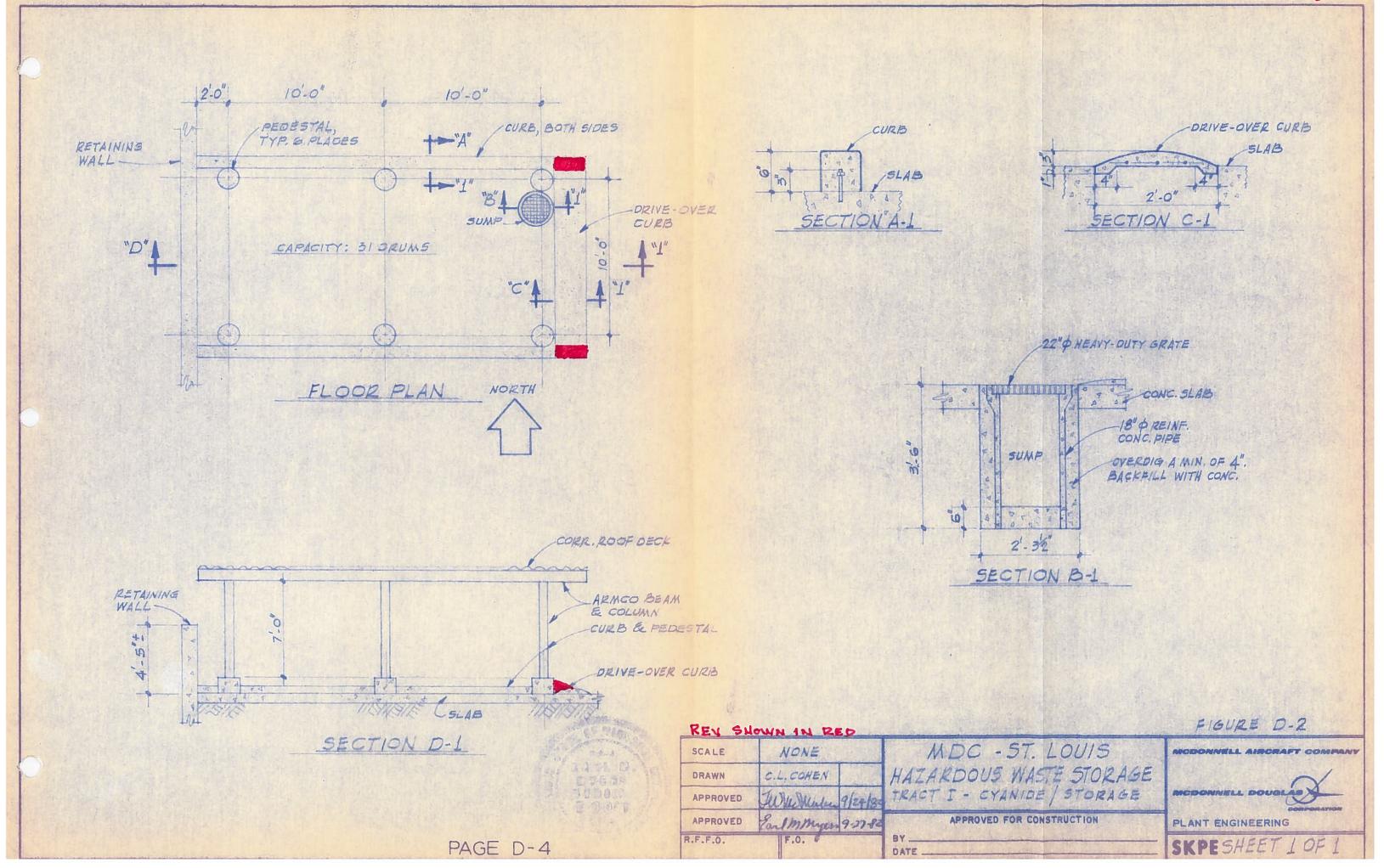
The maximum inventory of 55 gallon drums and 5 gallon carboys in the storage shelters at any given time during the operating life of the facility is not expected to exceed 732 drums. The drum storage areas currently hold approximately 280 55-gallon drums. Both drums of solids, and carboys and drums containing free liquids are stored at this facility. Therefore, the specific information provided in this section will follow a format required for containers storing free liquids. The container storage area consists of two separate storage areas. Area No. 1 is divided in two categories by a six inch high curb and each has a sump to accumulate any leakage that occurs. Containers of acids, alkalis, and unwashed empty drums that previously held hazardous wastes are stored in one section of this shelter. The other section of this shelter stores paint sludges, oils, solvents and unwashed empty drums that previously held oils or solvents.

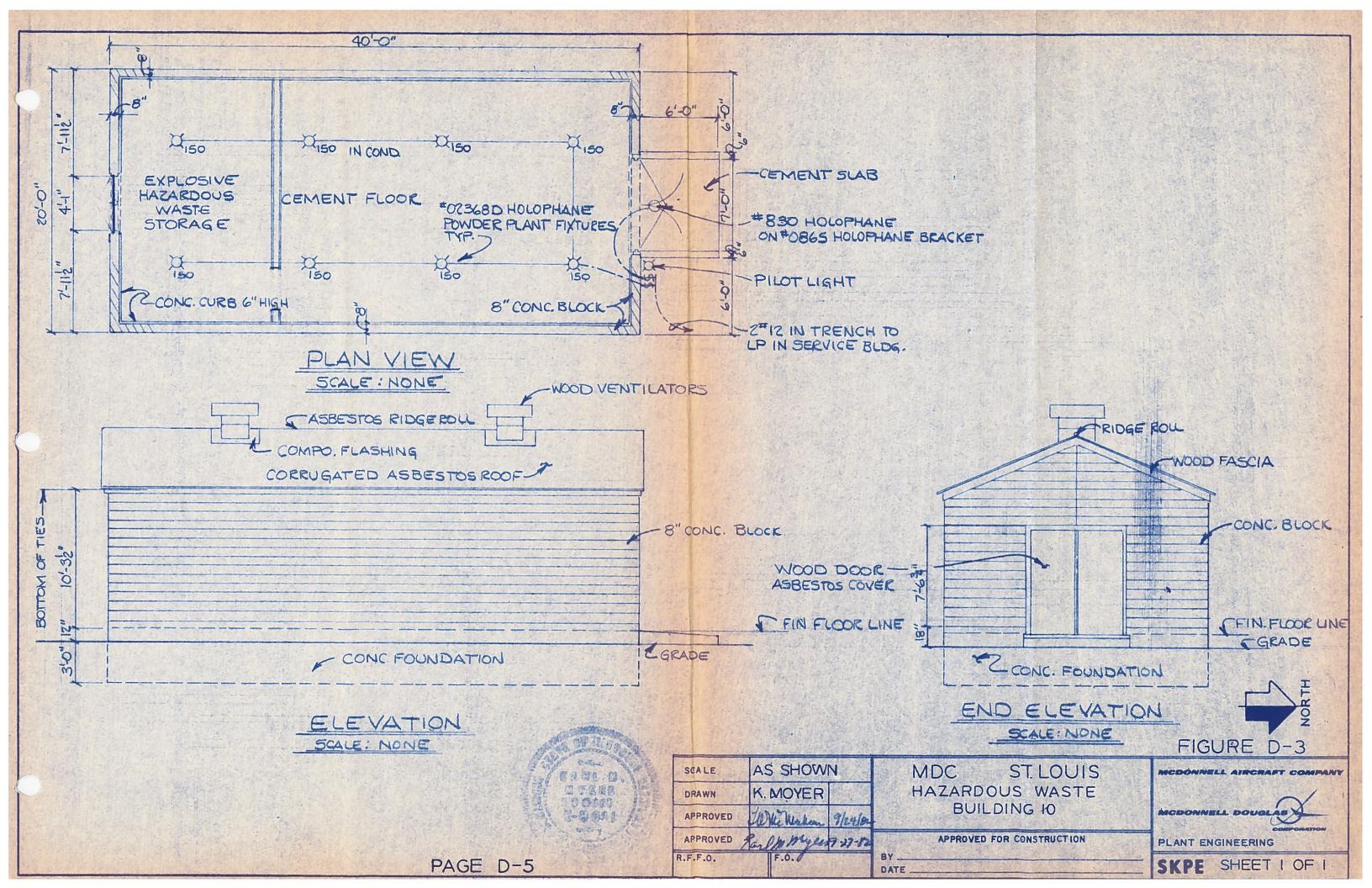
Area No. 2 is used for cyanides and sulfides. It has a sump to accumulate any leakage that occurs. Figures D-1 and D-2 show a plan view of the two separate container storage areas. Only unwashed empty drums are stacked. Full drums are never stacked in this storage facility.

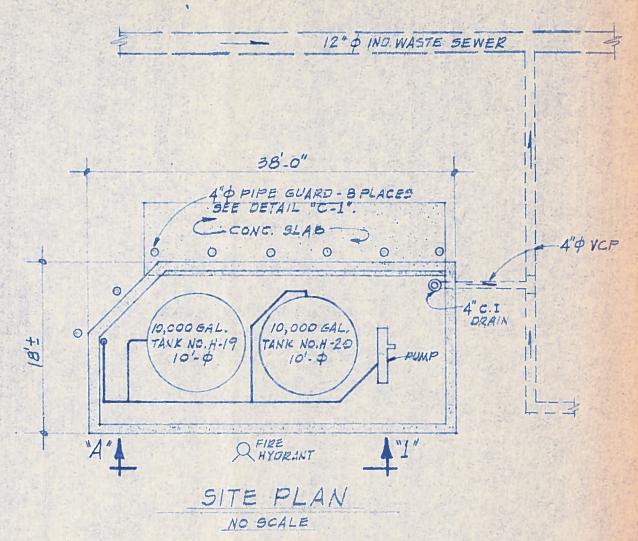
The containerized storage of waste ammunition and explosives is inside of a poured concrete and concrete block building (Figure D-3). The maximum inventory at any given time during the operating life of the facility is not expected to exceed a volume of 30,300 gallons. This waste is containerized in a dual fashion. First, by original design it is

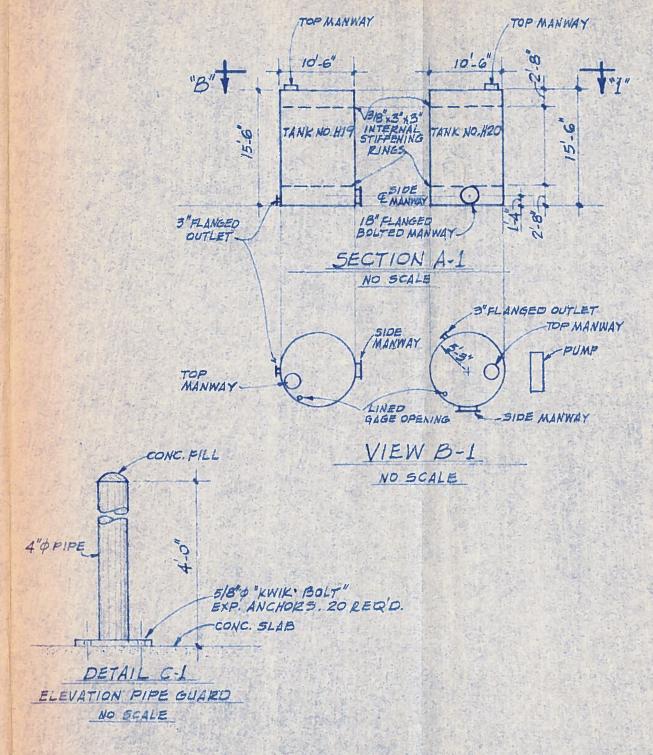














PAGE D-6

DRAWN C.L. COHEN HAZAE

APPROVED JUL Nature 9/21-92

APPROVED Fail Mining 9-27-92

F.O.

DATE

R.F.F.O.

MDC - ST. LOUIS HAZARDOUS WASTE STORAGE CHEM MILL CAUSTIC TANKS

APPROVED FOR CONSTRUCTION

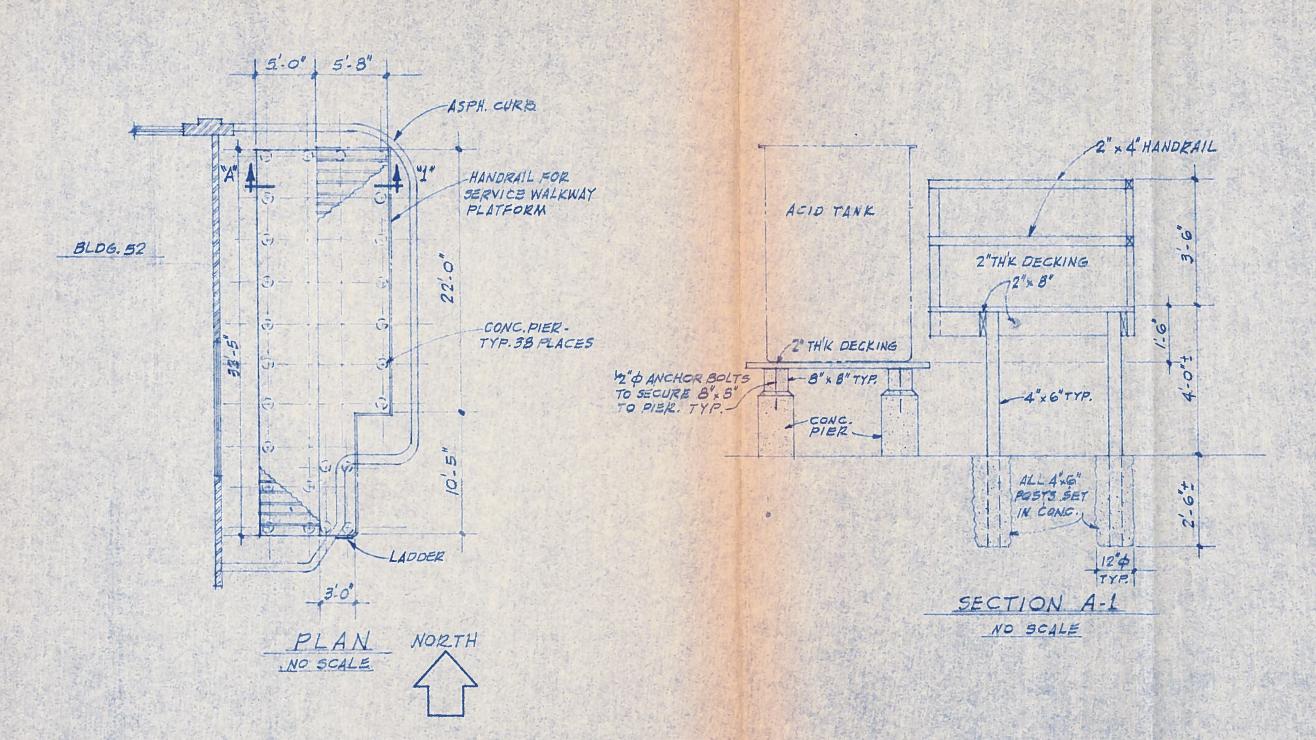
MCDONNELL AIRCRAFT COMPA

FIGURE D-4

NICIONNELL DOUGLAS

PLANT ENGINEERING

SKPESHEET 1 OF 1





PAGE D-7

APPROVED TO THE PROVED TO THE

MOC - ST. LOUIS HAZARDOUS WASTE STORAGE BLOG, 52 - EAST TANKS

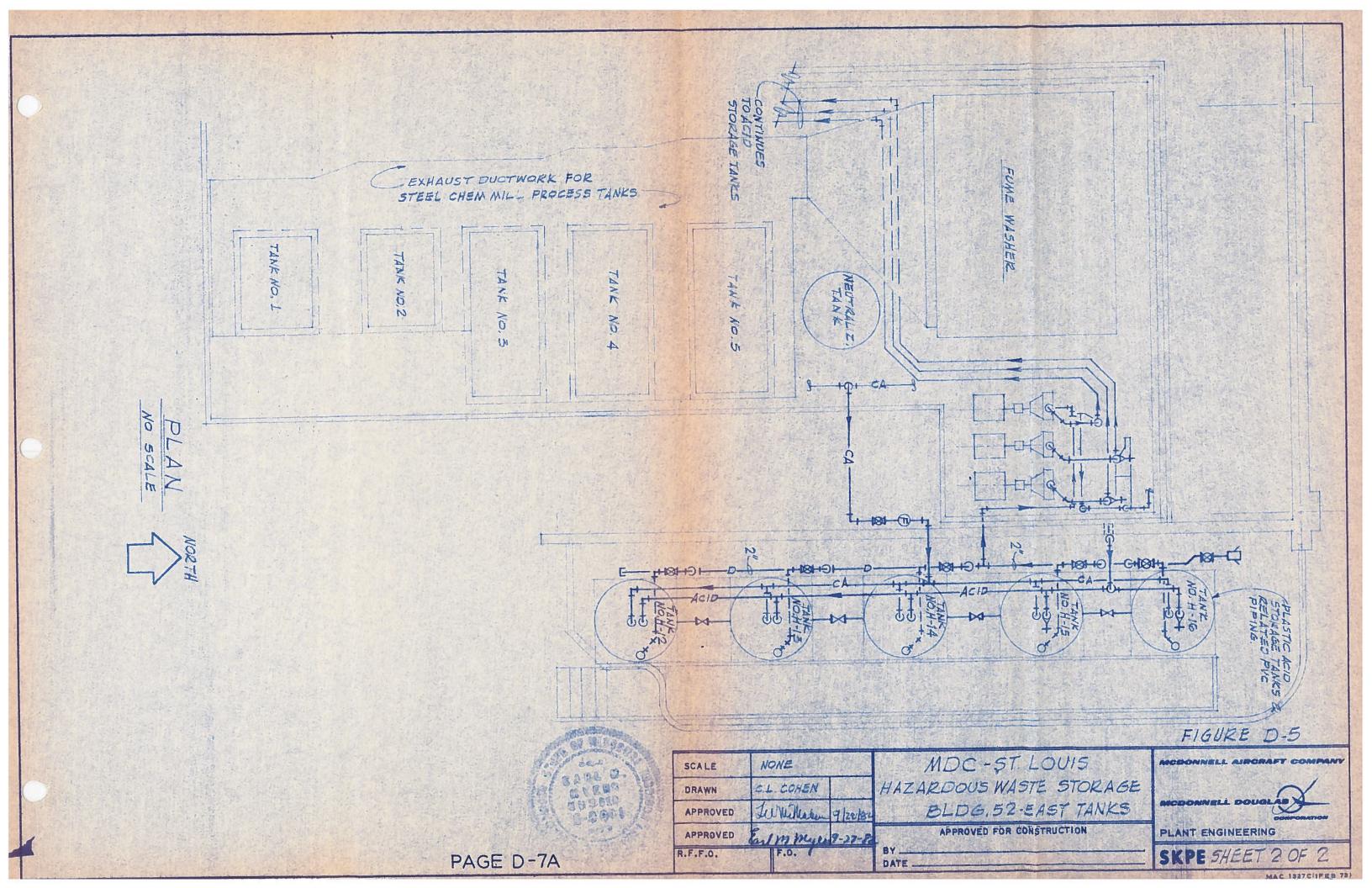
APPROVED FOR CONSTRUCTION

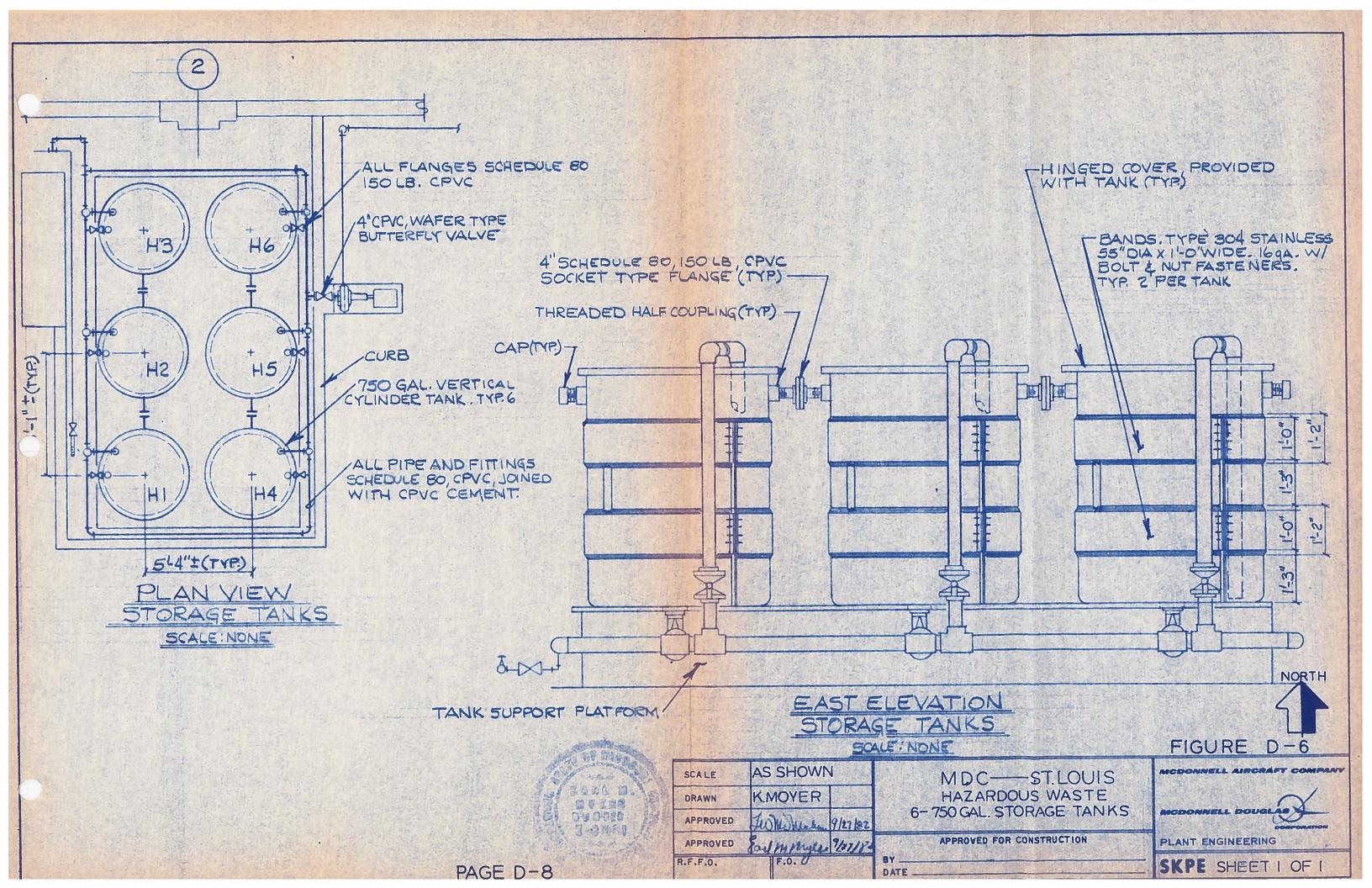
MCDONNELL DOUGLAS

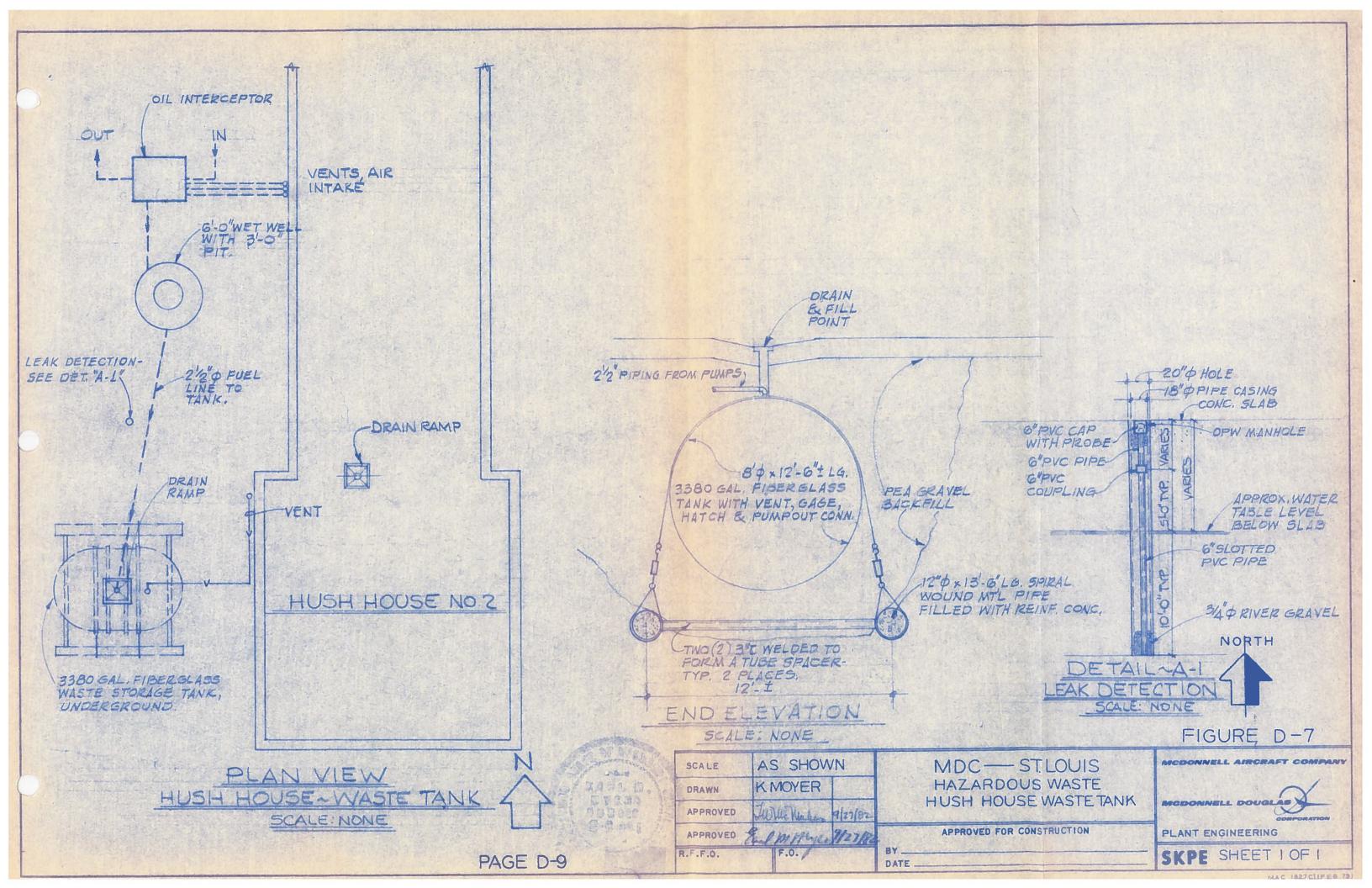
FIGURE D-5

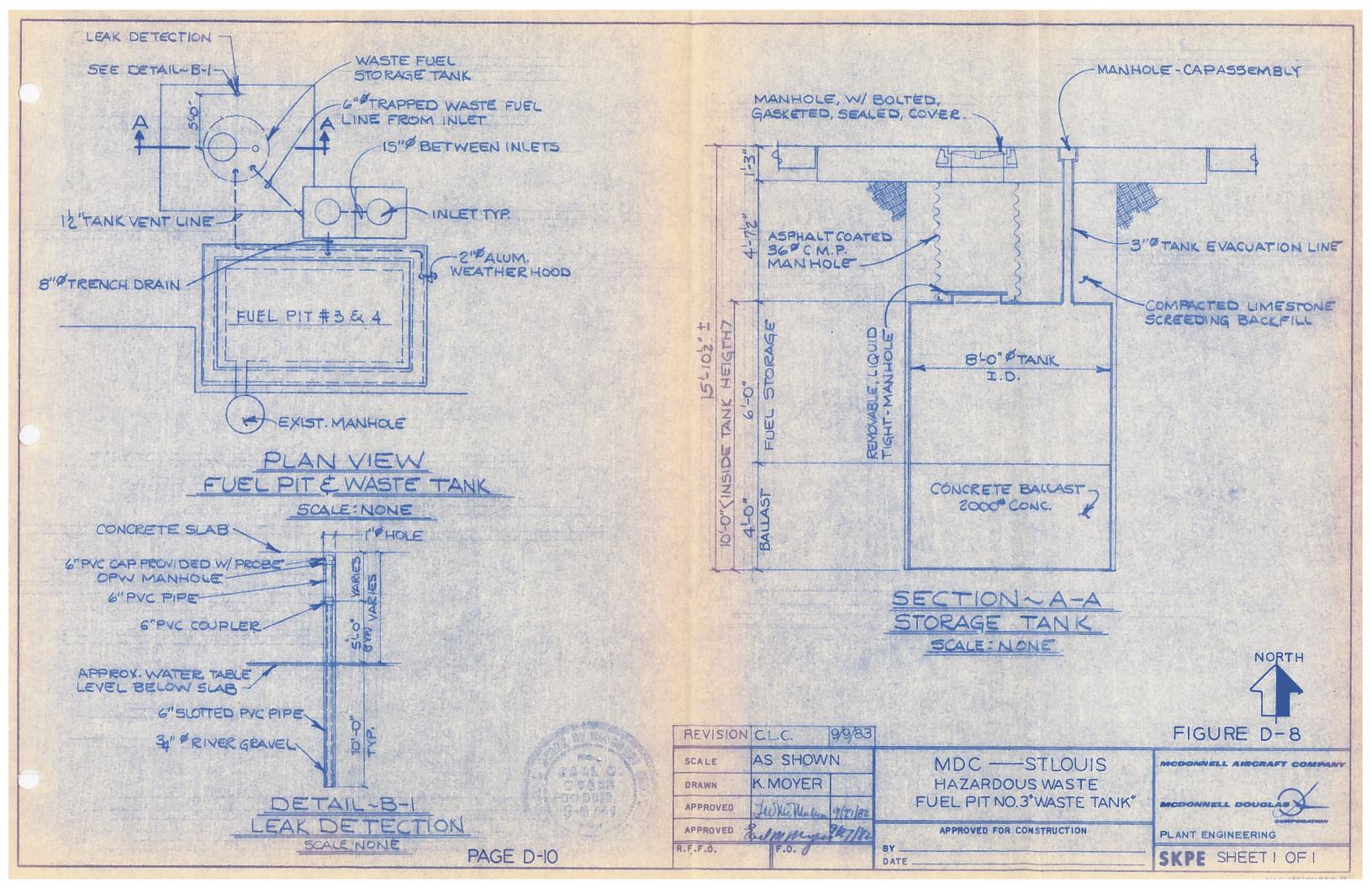
PLANT ENGINEERING

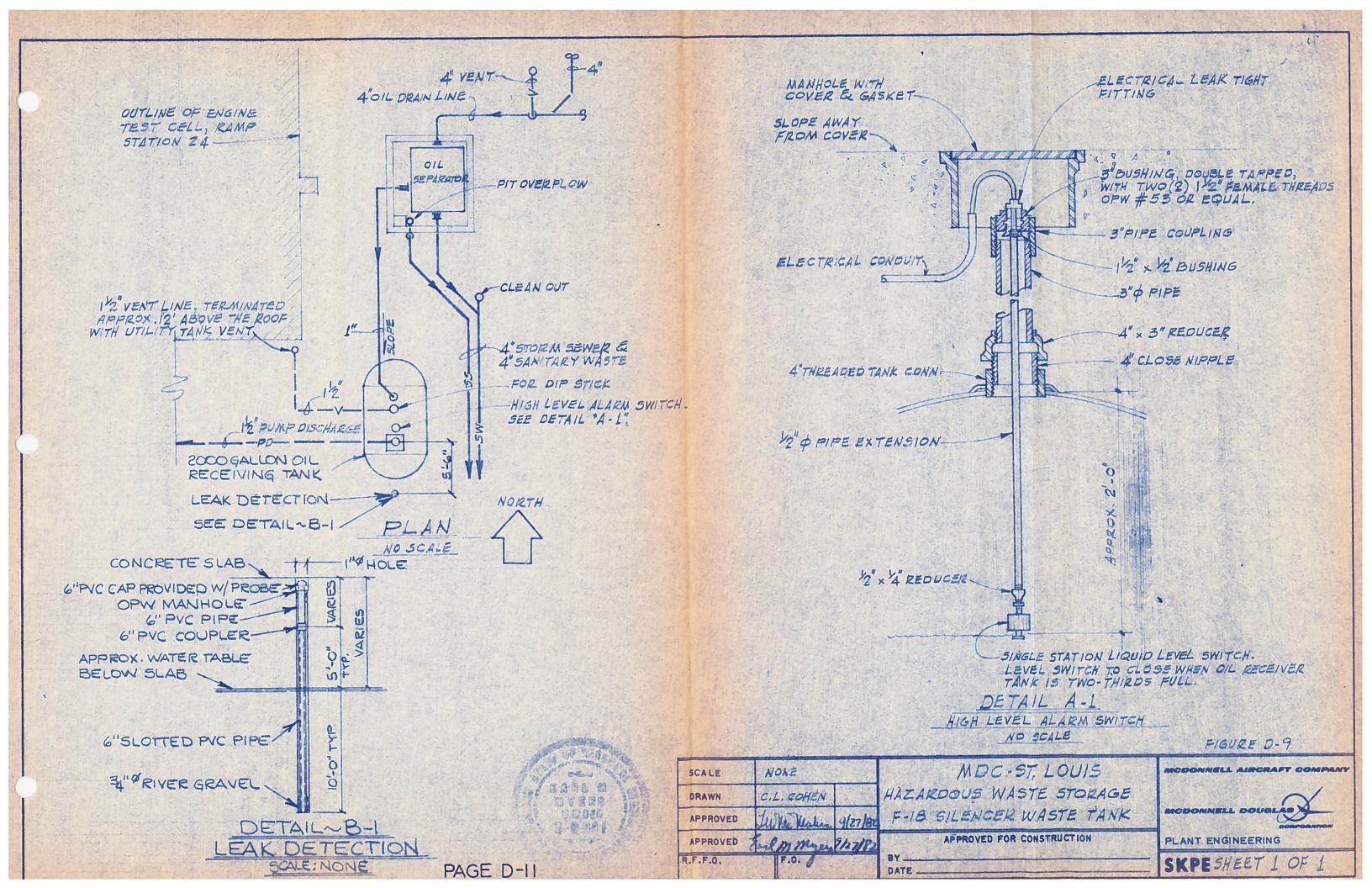
SKPE SHEET 1 OF 2

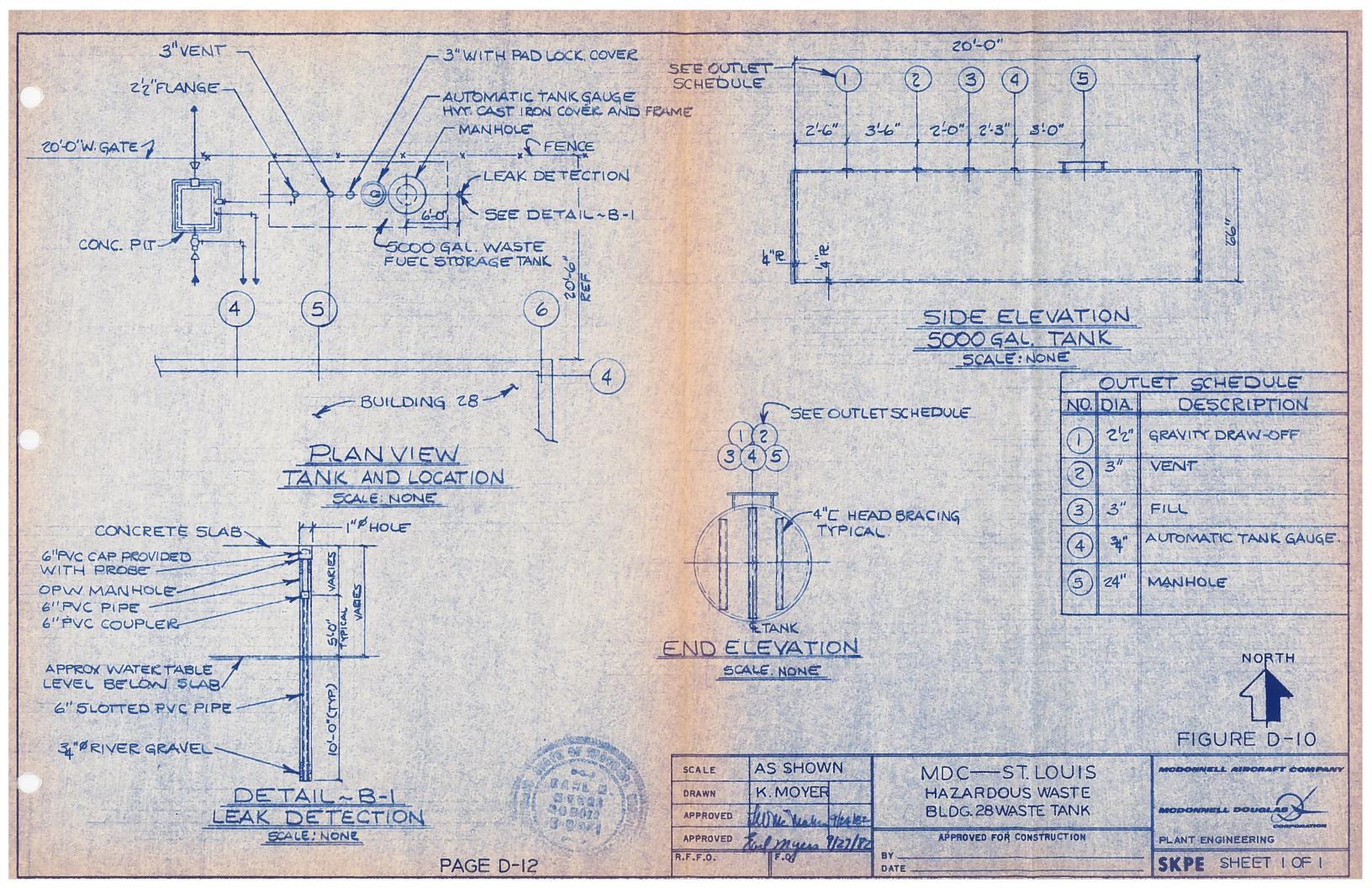


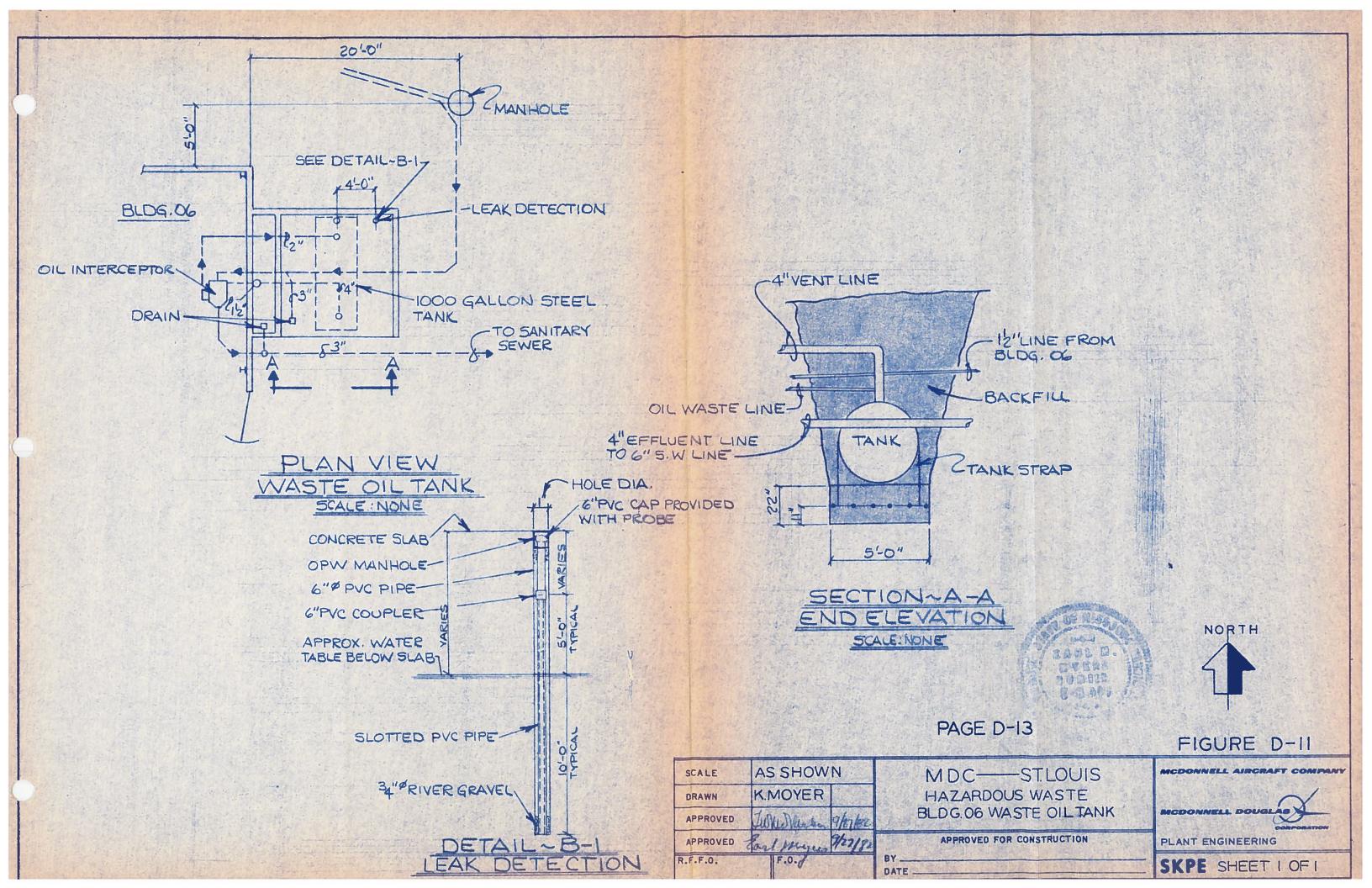


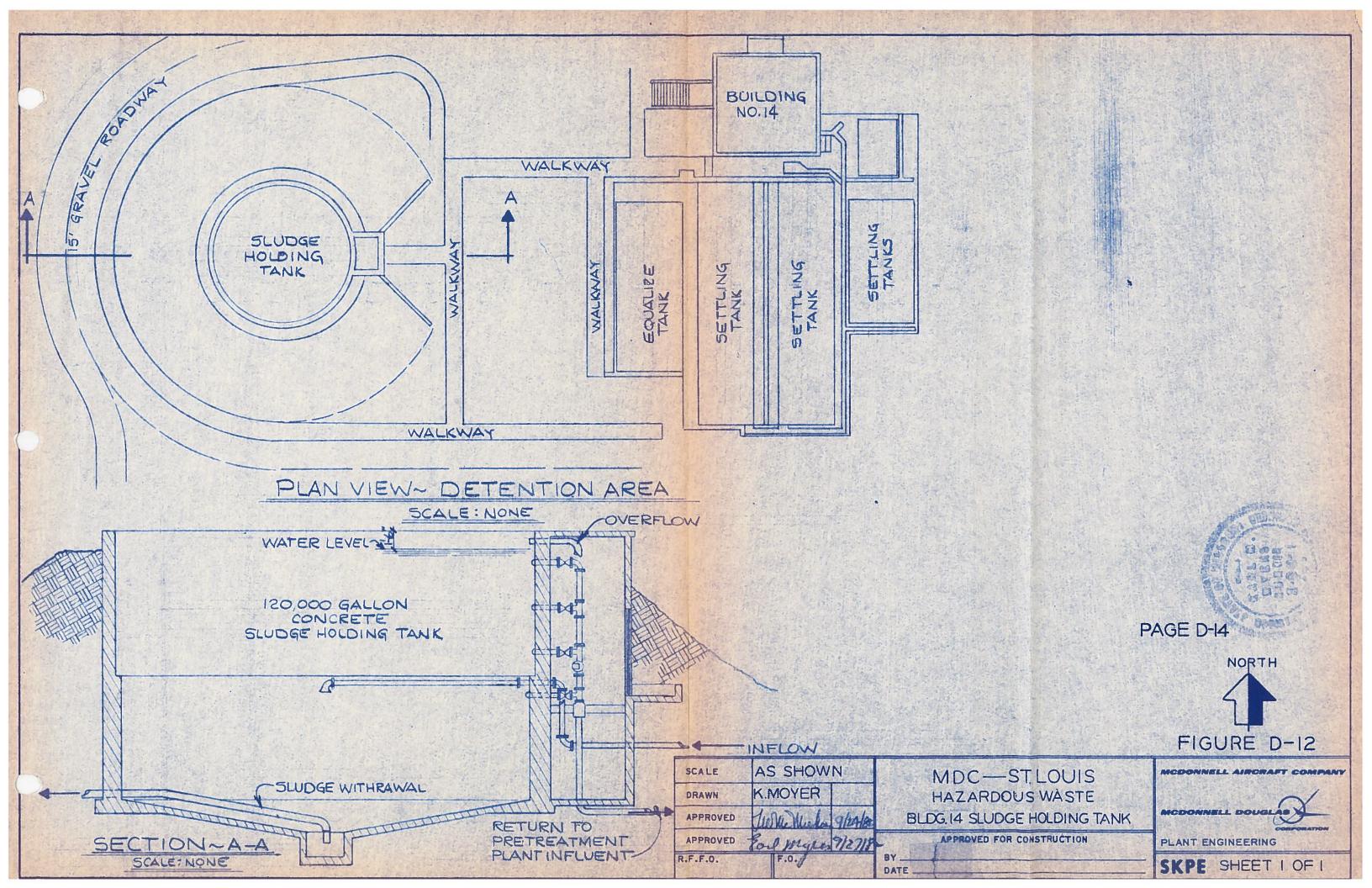


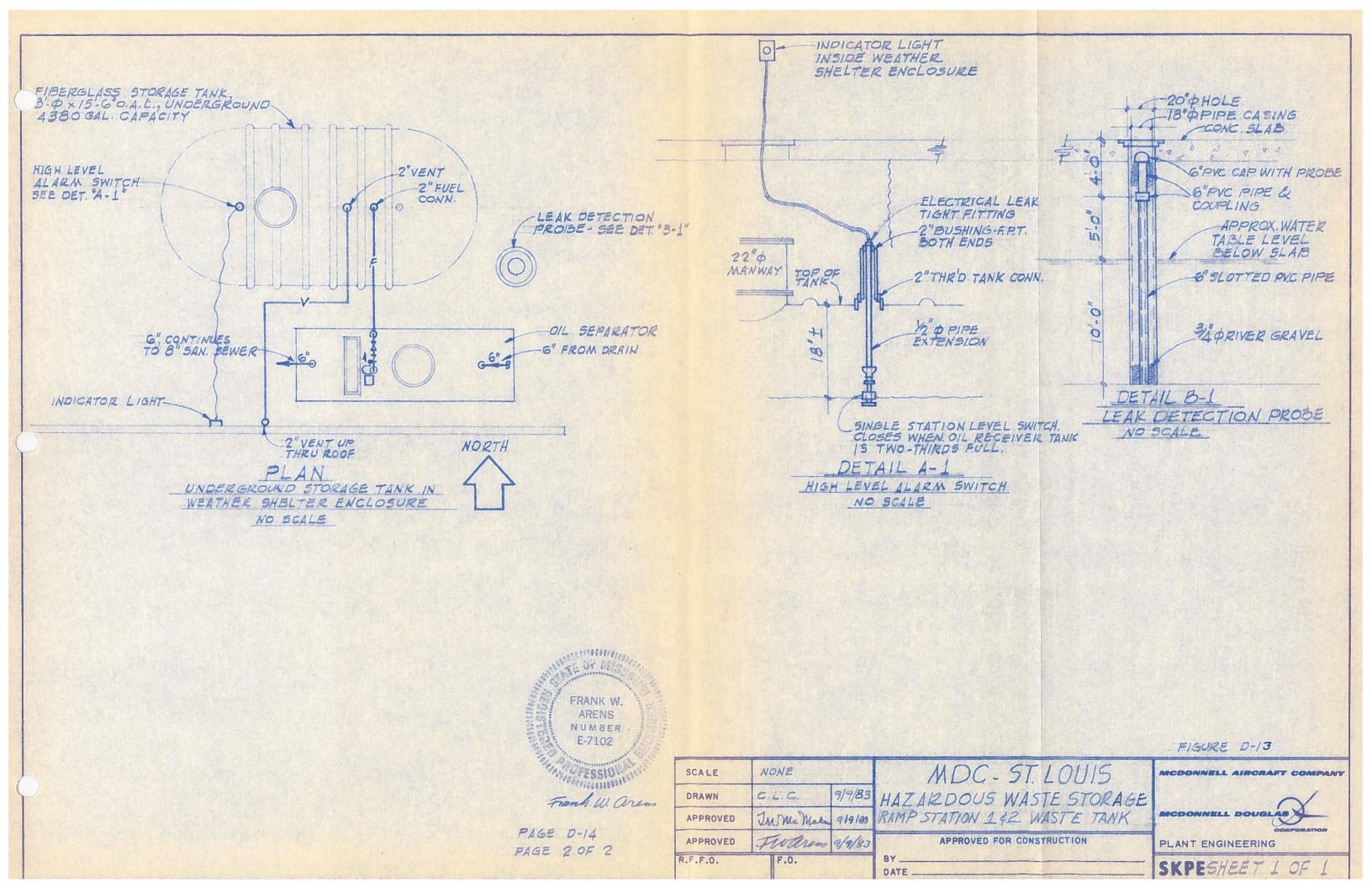












contained in a "housing" such as an "explosive bolt", "round of ammunition", "rocket motor", etc. When these items become waste, they are packaged in compliance with DOT regulations. No free liquids are involved with any explosive storage. See Attachment D-1 for the "Operations Manual".

D-la(1) Description of Containers [10 CSR 25-7.050(3)(F)]

Steel and plastic lined 55-gallon drums and 5 gallon plastic carboys are used at the facility to store the hazardous wastes cited above in D-la. The drums are constructed of low carbon steel that meets U.S. Department of Transportation Specification (DOT) Nos. 17E (Tight Head, Bung Type); 17H (Removable Head) and 37M (Polyethylene Lined, Tight Head Bung Type). The 5 gallon carboys are constructed of polyethylene and meet DOT Specification No. 2U. They are shipped in a cardboard overpack which meets DOT Specification No. 21P. The 17E drums are used to contain oils, solvents, and alkaline solutions. The 17H drums are used to contain paint sludges and other sludges and solids that will not corrode steel. The 37M drums are used to contain acid solutions. The 5 gallon carboys are used for holding acids, alkalis or compatible organic fluids.

D-la(2) Container Management Practices

Prior to transfer to the container storage area, liquids and sludge wastes generated in the processing area are sampled and then placed in the proper containers, and labeled according to Department of Transportation and Environmental Protection Agency regulations for hazardous materials. Transfer of drums to the container storage area is performed by a forklift truck. The container storage areas are under the supervision of the Plant Engineering - Environmental Pollution Control "Operator". This

Operator is responsible for receiving and supervising all of the containerized waste in this area. Drum containers are positioned in rows, two drums wide with an aisle between. This aisle is always maintained to allow for inspection for leaky containers. Five gallon carboys are packed in a cardboard carton, taped closed and stacked on a skid.

D-la(3) Secondary Containment System Design and Operation

The Area No. 1 storage area pad is constructed of concrete, with an asphalt overlay, designed for loads of 35 lb/in². A 6-in.-high (minimum) concrete curb lines the perimeter of this storage area and also divides the storage area into two independent isolated sections. The acid/alkali section is designed to contain 112 - 55 gallon drums. These drums will contain a maximum of 6,160 gallons. The curb area and sump of this section is designed to contain 1,965 gallons when occupied by 112 liquid filled drums. Therefore, our containment for this section is more than 30 percent (three times the minimum requirement). The paint sludge, oil/solvent section is designed to contain 224 - 55 gallon drums. These drums will contain a maximum of 12,320 gallons. The curb area and sump of this section is designed to contain 2,017 gallons when occupied by 224 full drums. These 224 full drums, if they all contained liquid, would contain 12,320 gallons. Therefore, our containment for this section is more than 15 percent (one and one half times the minimum requirement). The Area No. 2 storage pad is constructed of concrete designed for loads of 35 lb/in². A 6-in. (minimum) high concrete curb lines three sides of this area. The final perimeter curb (fourth side) is a 3-in. high roll over curb. This area is designed to contain 31 - 55 gallon drums of alkaline sulfide/alkaline cyanide solutions/solids. If all drums were filled to capacity with

liquid, the maximum gallons contained would be 1,705. The curb area and sump of this section is designed to contain 174 gallons when occupied by 31 full drums. This containment is slightly more than the 10% requirement. It should be noted that this cyanide/sulfide storage area is located at a higher grade elevation than the area where drums of acid are stored. This was by intent. In the event of acid drum failures combined with the failure of the acid storage containment sump system, the cyanide/sulfide area is protected. The fact that the cyanide/sulfide wastes are alkaline, reduces, if not eliminates, the chance of container failure due to internal corrosion.

These storage area pads are regularly inspected to ensure their integrity especially in respect to leak or spill containment. The sumps do not have automatic sump pumps, therefore, they can not be "accidently" emptied. A single, portable, sump pump, with a capacity of 21 gallons per minute is provided for emptying the sumps. This pump requires a trained operator who is present whenever it is used.

Precipitation accumulation is not a problem since the storage area in Figure D-1 is only open on one side and the roof on this side extends over the opening sufficently to prevent any significant precipitation from entering the curbed area. The storage area in Figure D-2 is open on three sides. These three sides have an extended roof over hang that nearly eliminates precipitation from entering the curbed area. Figure D-3 shows the explosive storage area which is inside a heated, weatherproof building, therefore, rainfall is not a consideration.

R

D-la(4) Removal of Liquids from Collection System

Each of the separate containerized storage areas in Figures D-1 and D-2 have separate sump areas with the floors sloped toward the sump to collect any leaks or spills. Accumulations are removed from the sumps as soon as an analysis is completed to determine whether they are either hazardous or acceptable for release. If an analysis indicates that a sump contains hazardous waste, the material is removed from the sump, drummed, labeled, and transferred to the appropriate container storage area. If it is not hazardous, then it is transferred to an industrial sewer. As an added precaution, all containers are placed on wooden skids to prevent direct contact with leaking liquids.

D-1b Containers Without Free Liquids

D-lb(1) Test for Free Liquids

Containers that must have no free liquids are opened and visually inspected. If any free liquid is found, it is transferred to another container and labeled. An inert liquid-absorbing medium is then added to the container of solids to absorb the final traces of free liquid. The container is then closed and stored in the storage areas described in D-la.

- D-lb(2) Description of Containers

 See section D-la.
- D-1b(3) Container Management Practices

 See section D-la.
- D-1b(4) Container Storage Area Drainage
 See section D-la.

D-2 Tanks [40 CFR 122.25(b)(2), 10 CSR 25-7.050(4)(A) and (B)]

D-2a Description of Tanks

Two 10,000-gallon capacity, vertical, above-ground tanks provide 20,000gallon storage for waste sodium hydroxide solution from chemical milling of aluminum. These two tanks are designated as H-19 and H-20. This waste alkaline solution has a specific gravity of 1.3. Tanks and piping are constructed of carbon steel (Figure D-4). Each tank is structurally supported on a bed of crushed limestone. The limestone is held in place by the 3-inch-thick asphalt spill pad that surrounds these tanks. This asphalt pad is surrounded by a 9-inch-high asphalt curb. The area inside the curb is drained to our industrial waste water pretreatment plant. Each tank is equipped with a top and side manway, a vent/overflow, and a liquid level indicator. The inlet to these tanks is directly connected to the process tanks that generate this waste. The outlet of these tanks is piped directly to a pump that is used for loading disposal vehicles. These tanks are protected from disposal vehicle damage, by the strategic placing of 4-inch-diameter concrete-filled pipe guards on the traffic lane sides of this area.

Five 500-gallon capacity, above-ground tanks provide 2,500-gallon maximum storage for waste nitric and hydrofluoric acid solution from chemical milling of titanium. These five tanks are designated as H-12, H-13, H-14, H-15, and H-16. This waste acid solution has a specific gravity of 1.3. All five tanks are open top, vertical, self-supporting, flat bottom, cylindrical, one piece molded black polyethylene plastic. The tanks are structurally supported on a wooden platform. The tank outlets are interconnected with schedule 80 CPVC piping and valves. The tanks are covered with hinged tops to prevent precipitation from entering. The area under

D-2a (Continued)

the tanks and platform is sealed with a 3-inch-thick asphalt pad. This pad is surrounded by a 6-inch-high asphalt curb. Inside the curb area is a 4-inch depth of crushed limestone and a drain to our industrial waste water pretreatment plant (Figure D-5). The tank overflows are interconnected to allow an overfilled tank to flow into the remainder of the tanks. The inlet to these tanks is directly connected to the process tanks that generate this waste. The outlet of each tank connects to a common manifold drain line that terminates within the curb area. This manifold system is used for emptying the tanks.

Six 750-gallon capacity, above-ground tanks provide 4,500-gallon maximum storage for waste nitric and hydrofluoric acid solution from chemical milling of titanium. These six tanks are designated as H-1, H-2, H-3, H-4, H-5, and H-6. This waste acid solution has a specific gravity of 1.3. All six tanks are open top, vertical, self-supporting, flat bottom, cylindrical, one piece molded high density black polyethylene plastic. The tanks are structurally supported on a wooden platform. The tank outlets are interconnected with schedule 80 CPVC piping and valves. The tanks are closed with cap type covers to prevent precipitation from entering. The area under the tanks and platform is sealed with a 3-inch-thick asphalt pad. This pad is surrounded by a 6-inch-high asphalt curb. Inside the curb area is a 4-inch depth of crushed limestone and a drain to the previously mentioned industrial waste water pretreatment plant (Figure D-6). Any overflow from these tanks will be handled by the above-described curb and drain system. The inlet to these tanks is directly connected to the progress tank that generates this waste. The outlet of each tank connects to a common manifold drain line that terminates within the curb area. This manifold is used for emptying the tanks.

D-20, 1 of 2

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D-2a (Continued)

When waste acid is transferred to the 500-gallon and 750-gallon polyethylene tanks, one pipefitter pumps the acid and another pipefitter checks the tank to be sure that it is empty before the transfer starts and observes it to ensure that it does not overflow. If overfilling should occur, and the spill enters the industrial sewer, then the operator at the Industrial Waste Water Pretreatment Plant is notified and has 45 minutes to prepare before the spill arrives. If a spill is unobserved, then the automatic pH sensing system will sound an alarm in the Bldg. 5 Power House, which is manned 24 hours per day, 365 days per year, and the supervisor will call the Pretreatment Plant operator.

The waste acid in these tanks is neutralized with lime and then processed through the Industrial Waste Water Pretreatment Plant, which ultimately discharges to the Metropolitan Sewer District POTW in St. Louis County. The acid in these tanks is processed whenever there is sufficient quantity to make it economically feasible to process a batch (approximately 500 gallons).

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D-2a (Continued)

One 3,380-gallon capacity, horizontal, below grade tank provides storage for waste turbine engine (jet aircraft) and hydraulic system spillage. This tank is designated as "Hush House Waste Tank". This waste hydrocarbon mixture has a specific gravity of 0.8. The tank is constructed of polyester resins reinforced with glass fibers and designed for storing hydrocarbons. The tank is strapped to a concrete weight and completely surrounded with pea gravel. A concrete slab covers this tank as well as the entire area where the tank is located (Figure D-7). The tank is equipped with a liquid level sensing system that indicates when the tank is approximately 80% full. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well adjacent to this tank.

One 2,000-gallon capacity, vertical, below grade tank provides storage for turbine engine (jet aircraft) fuel that is spilled during fueling or defueling operations. This tank is designated as "Fuel Pit No. 3 Waste Tank". This waste turbine engine fuel has a specific gravity of 0.8. The tank is constructed of 1/4" thick carbon steel with an ASME-approved coal tar apoxy outer coating typical for underground tanks. The tank has a nominal capacity of 3,000 gallons but the bottom one-third (1,000 gallon volume) is filled with concrete. A concrete slab covers this tank as well as the entire area where the tank is located (Figure D-8). The tank is equipped with a liquid level indicating system that sounds an alarm when the tank is approximately 75% full. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well adjacent to this tank.

D-2a (Continued)

One 2,000-gallon capacity, vertical, below grade tank provides storage for turbine engine (jet aircraft) fuel that is spilled during fueling or defueling operations. This tank is designated as "Fuel Pit No. 4 Waste Tank". This waste turbine engine fuel has a specific gravity of 0.8. The tank is constructed of 1/4" thick carbon steel with an ASME-approved coal tar epoxy outer coating typical for underground tanks. A concrete slab covers this tank as well as the entire area where the tank is located (Figure D-13). The tank is equipped with a liquid level indicating system that sounds an alarm when the tank is approximately 75% full. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well adjacent to this tank.

D-2a (Continued)

One 2,000-gallon capacity, horizontal, below grade tank provides storage for waste turbine engine (jet aircraft) and hydraulic system spillage. This tank is designated as "F-18 Silencer Waste Tank". This waste hydrocarbon mixture has a specific gravity of 0.8. The tank is an Owens Corning Fiberglass Model 2000 D-2, fiberglass storage tank for underground service. It has a nominal capacity of 2,000 gallons and an actual capacity of 2,130 gallons. A concrete slab covers this tank as well as the general area where the tank is located (Figure D-9). The tank is equipped with a liquid level sensing system that flashes an alarm when the tank is approximately 75% full. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well adjacent to this tank.

One 5,000-gallon capacity, horizontal, below grade tank provides storage for jet aircraft fuels that are leaked or spilled during the testing of aircraft fuel systems. This tank is designated as "Bldg. 28 Waste Tank". This waste aircraft fuel has a specific gravity of 0.8. The tank is constructed of 1/4-inch-thick carbon steel with three 4-inch-wide steel channel braces welded to the external surface of each end. A concrete slab covers this tank as well as the general area where the tank is located (Figure D-10). Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well adjacent to this tank. This tank collects only spillage that occurs during testing fuel systems. In order to prevent overfilling, the tank level is checked whenever a spill occurs. In addition, routine maintenance at this building provides tank level checking once per month. These two independent measures provide a system to prevent overfilling. The leak detection system associated with this tank fulfills the

D-2a (Continued)

inspection requirements. This detection system is monitored each work day during our facility inspection.

One 1,000-gallon capacity, horizontal, below grade tank provides storage for oil that has been separated from the condensate of an oil-lubricated, steam-operated air compressor. This tank is designated as "Bldg. 6 Waste Oil Tank". The waste hydrocarbon mixture has a specific gravity of 0.9. This tank is an Air Therm Manufacturing Company Model 10 1/2 UG. It is constructed of 10 gauge carbon steel with an outer coating of black asphaltum. The tank is strapped to the concrete pad on which it rests. A concrete slab covers the area above this tank (Figure D-11). Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well adjacent to this tank. This tank collects oil that has been removed by an oil interceptor. This interceptor operates by gravity, with the oil being diverted into the waste oil tank and the waste water flowing into a sanitary sewer. The tank level is routinely checked by the area Maintenance Department. The level is also randomly checked by the inspector during the leak detection system monitoring that takes place each work day.

One 120,000-gallon capacity, inground tank provides storage for industrial waste water treatment sludge prior to dewatering. This tank is designated as "Bldg. 14 Sludge Holding Tank". This waste has a specific gravity of approximately 1.1. This tank is an open top tank, constructed of reinforced concrete, a minimum of 12 inches in thickness. This tank was previously used as a digestor for anaerobic decomposition of sanitary sewage sludge (Figure D-12). This inground tank is equipped with an overflow drain which leads to the influent of our waste water pretreatment plant.

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D-2a (Continued)

The sludge is dewatered with a centrifuge and is disposed of at a TSDF that has been approved by the EPA and the state.

One 4,380-gallon capacity, horizontal, below grade tank provides storage for jet aircraft fuels that are leaked or spilled during the repair of aircraft fuel systems. This tank is designated as "Ramp Station 1 and 2 Waste Tank". This waste aircraft fuel has a specific gravity of 0.8.

The tank is manufactured by the "Lifetime Fiberglass Tank Company". It is constructed of polyester resins reinforced with glass fibers and is designed for storage of gasoline, aviation fuel, and oil. It has a nominal capacity of 4,000 gallons and an actual capacity of 4,380 gallons. A concrete slab covers this tank as well as the general area where the tank is located (Figure D-14). The tank is equipped with a liquid level sensing system that lights a visual alarm when the tank is approximately 80% full. Leaks are monitored by a hydrocarbon sensing system that is installed in a monitoring well adjacent to this tank.

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D-2b Tank Corrosion and Erosion

The two 10,000-gallon waste sodium hydroxide storage tanks are constructed of carbon steel (Figure D-4). Since this waste is stored at ambient temperatures of 0°F to 100°F, the corrosion rate is less than would exist in dissolved air in water supply storage tanks. These tanks have been in service for a minimum of fifteen years with no signs of corrosion.

The five 500-gallon waste nitric and hydrofluoric acid storage tanks are constructed of one piece molded black polyethylene plastic (Figure D-5). These tanks are considered completely inert to their contents.

Tank Description	Disposal <u>Method</u>	Regulations Applicable	<u>Category</u>
Two 10,000-gallon capacity tanks designated as $H-19$ and $H-20$	Recycle	DNR .	RCRA Exempt
Five 500-gallon capacity tanks designated as H-12, H-13, H-14, H-15, H-16	TSDF	DNR and EPA	
Six 750-gallon capacity tanks designated as H-1, H-2, H-3, H-4, H-5, H-6	TSDF	DNR and EPA	
One 3,380-gallon capacity tank designated as "Hush House Waste Tank"	Recycle	DNR	RCRA Exempt
Two 2,000-gallon capacity tanks designated as "Fuel Pit No. 3 Waste Tank" and "Fuel Pit No. 4 Waste Tank"	Recycle	DNR	RCRA Exempt
One 2,000-gallon capacity tank designated as "F-18 Silencer Waste Tank"	Recycle	DNR	RCRA Exempt
One 5,000-gallon capacity tank designated as "Bldg. 28 Waste Tank"	Recycle	DNR	RCRA Exempt
One 1,000-gallon capacity tank designated as "Bldg. 6 Waste Oil Tank"	Recycle	DNR	RCRA Exempt
One 120,000-gallon capacity tank designated as "Bldg. 14 Sludge Holding Tank"	TSDF	DNR and EPA	
One 4,380-gallon capacity tank designated as "Ramp Station 1 and 2 Waste Tank"	Recycle	DNR	RCRA Exempt

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TANK DESCRIPTION	STANDARD DESIGN	DIMENSIONS	TANK DETAILS MAXIMUM CAPACITY	SHELL THICKNESS	DESCRIPTION OF FEED SYSTEMS, SAFETY CUTOFFS, BYPASS SYSTEMS, OVERFLOW CONTROL, AND PRESSURE CONTROL
Five 500-gallon capacity, open-top, vertical, self-supporting flat bottom, cylindrical above-ground tanks. Designated as Tanks H-12, H-13, H-14, H-15, and H-16.	U.S. Plastic Corporation	48" dia. x 71" high	555 gallons	1/4"	Waste solution comes from one of two process tanks. Each tank contains 450 gallons. When the solution in either of these two tanks is declared waste, the on-site pipefitter is notified to transfer this solution into the waste storage tanks. This transfer is accomplished with a continuous recirculating process tank pump via valving and schedule 80 CPVC piping. In the event of emergency, the valves may be closed and/or the pump stopped. These storage tanks are covered with loose-fitting (not sealed) covers.
					The process tanks and the storage tanks are open to the atmosphere and operate at atmosphere pressure; therefore, no pressure controls exist. Any overflow that would occur would be contained by a six-inch-high asphalt curb and diverted into our own Industrial Waste Water Pretreatment Plant. The tanks are interconnected to allow bypassing from one tank to another as they are individually filled.

In reference to the suitability of using polyethylene containers for holding mixtures of nitric and hydrofluoric acids, we cite the following:

Code of Federal Regulations, Title 49, Subchapter C - Hazardous Materials Regulation, Part 173.299.

"173.299 Etching acid liquid, n.o.s. (a) Etching acid liquid shall be a mixture of nitric acid, hydrofluoric acid, having nitric acid in concentrations of not more than 60 percent by weight, hydrofluoric acid in concentrations of not less than 4 percent by weight and water not less than 24 percent by weight, and may contain acetic acid. These mixtures must be packed in specification containers as follows: (1) Specification 12A (178.210 of this subchapter). Fiberboard boxes with Specification 2E (178.24a of this chapter) inside polyethylene bottles have a minimum wall thickness of 0.030 inch and screw-cap closures. Net weight per bottle may not be over 10 pounds each. The net weight per package may not be more than 40 pounds. (2) Specification 6D or 37M (non-reusable) (178.102, 178.134 of this subchapter). Cylindrical steel overpack with inside Specification 2S or 2SL (178.35 or 178.35a of this subchapter) polyethylene container not over 55 gallons capacity. Specification 37M overpack of over 30 gallon capacity must be constructed of at least 20 gauge steel throughout."

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DATE: 09 SEP 83 REVISION NO.: 1 (D)

TANK DESCRIPTION	STANDARD DESIGN	DIMENSIONS	TANK DETAILS MAXIMUM CAPACITY	SHELL THICKNESS	DESCRIPTION OF FEED SYSTEMS, SAFETY CUTOFFS, BYPASS SYSTEMS, OVERFLOW CONTROL, AND PRESSURE CONTROL
Six 750-gallon capacity, open-top, vertical, self-supporting, flat bottom, cylindrical above-ground tanks. Designated as Tanks H-1, H-2, H-3, H-4, H-5, and H-6.	Chem-Tainer Industries, Division of County Plastics Corporation	55" dia. x 72" high	740 gallons	3/8"	Waste solution comes from one 4,000-gallon process tank. When the solution in this tank is declared waste, the on-site pipefitter is notified to transfer this solution into the waste storage tanks. This transfer is accomplished with a continuous recirculating process tank pump via valving and schedule 80 CPVC piping. In the event of emergency, the valves may be closed and/or the pump stopped. These storage tanks are covered with loose-fitting (not sealed) covers.
					The process tank and the storage tanks are open to the atmosphere and operate at atmosphere pressure; therefore, no pressure control exists. Any overflow that would occur would be contained by a six-inch-high asphalt curb and diverted into our own Industrial Waste Water Pretreatment Plant. The tanks are interconnected to allow bypassing from one tank to another as they are individually filled.

In reference to the suitability of using polyethylene containers for holding mixtures of nitric and hydrofluoric acids, we cite the following:

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DATE: 09 SEP 83 REVISION NO.: 1 (D)

TANK DESCRIPTION	STANDARD DESIGN	DIMENSIONS	ANK DETAILS MAXIMUM CAPACITY	SHELL THICKNESS	DESCRIPTION OF FEED SYSTEMS, SAFETY CUTOFFS, BYPASS SYSTEMS, OVERFLOW CONTROL, AND PRESSURE CONTROL
One 120,000-gallon capacity, in-ground, open top tanks. Designated as "Bldg. 14 Sludge Holding Tank".	1. Originally designed as sewage sludge digestor in January 1941 by "Russel and Axon" Consulting Engineers. 2. Modified for Industrial Waste Sludge Holding Tank by McDonnell Aircraft Co. during 1968.	33' dia. x 21' high. Note: Over- flow is at 19' depth as is effective fill level.	121,555 gallons	Walls are 12" minimum thickness reinforced concrete. Bottom is 6" thick rein- forced concrete.	Sludge collects in settling tanks and is moved by hydraulic pressure to a manually operated pump. The Waste Water Pretreatment Plant operator controls this pump. Ridged piping conducts the settled sludge from the pump to the sludge-holding tank. In the event of an emergency, valves may be closed and/or the pump stopped. The holding tank is open to the atmosphere and operates at atmospheric pressure; therefore, no pressure control exists. Any overflow that would occur would be discharged into the influent line of our Pretreatment Plant and thus be collected in the settling tanks (a closed loop system). The overflow outlet is located two feet below the top of the sludge-holding tank.

In reference to the suitability of using reinforced concrete for holding sludge with the pH range of 7.0 to 8.0, we attest to the fact that we began holding this type of sludge in this tank in 1969. Since then, at approximately five-year intervals, we have emptied this tank. When the tank was empty, it was inspected, and no observable change from its 1969 condition was detected.

ISSOURI DEPARTMENT OF NATURAL RESOURCES

Waste Management Program

P.O. Box 1368

Pefferson City, Missouri 65102

FACILITY I.D. NO REVISION NO.: 1

Confidentiality Requeste	d _//_
Confidentiality Granted/De	nied <u>//</u>
Date Public Notice	

APPLICATION FORM HAZARDOUS WASTE MANAGEMENT FAC

Name of	Operator McC	Donnell Dougl	as Corpor	ation	•		H)	
	P.O. Box		Service 1987,		in the second	Phone _	(314) 232	2-3319
City	St. Louis	era :	of the parent	itate	Hissouri		Zip Code	68166
Ownershi	p Status 🔟	Federal /	7 State	<u>√</u> P	rivate <u>/</u>	Pub1	ic 🗍	Other
_	Land Owner							. 10
ddress	P.O. Box 51	6	* 5	i .		_Phone _	(314) 232	2-3319
City	St. Louis	5 11 198	8	State _	Missouri	**	_Zip Code	63166
• ****	Owner (other)		12 y				8 " 2 8) (#)
	- A	1 No. 100 (20)	* "	e seen	·	Phone		
			54 . _{78 . 5}	State _			_Zip Code	
	Facility		2		Na eff	440		
Locatio	n of Facility	. Norwest C	ity of To	wn Haze	Pood	County	St. Lou	ijs -
		NE	_1/4	~ SW_	_1/4	NW	/4, Secti	on <u>5</u>
	9 8 9	Township	46	·	Range	6	No. of	Acres 201
	(A) (B) (C)				7.0		90 - 22 - 3	`a+h

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Type of Hazardous Waste Management Facility (Check App	DATE: 09 SEP 83
Typefmen	the state of the second of the
Storage [X] Container or Tanks (Attach	7
Form SCT)	Surface Impoundment (Attach Form TSI)
Surface Impoundment (Attach Form SSI)	Incinerator (Attach Form TI)
Waste Pile (Attach Form SWP)	Landfarm (Attach Form TLF)
<u>Disposal</u>	and the second of the second o
Landfill (Attach Form DL)	and a sum of the second control of the secon
Surface Impoundment (Attach Form OSI)	
Waste Pile (Attach Form DWP)	
. Is this facility to service more than one generator?	YES X NO
More than one type of waste? /*/ YES / NO	
Engineering Plans	As Required By - 10 CSR 25-7.011(2)(C) 1.H., I., and 2.
Compliance with General Facility Standards	10 CSR 25-7.011(3)
Preparedness and Prevention Plan	10 CSR 25-7.011(4)
Contingency PTan and Emergency Procedures Plan	10 CSR 25-7.011(5)
Compliance with the Manifest, Recordkeeping and Reporting	10 CSR 25-7.011(6)
Operations Manual	10 CSR 25-7.011(7)
Compliance with the Financial Requirements	10 CSR 25-7.011(8)
Closure and Post Closure Plan	10 CSR 25-7.011(9)
Konitoring Plan	10 CSR 25-7.011(10)
ng Fee (Not to exceed \$500 for the entire facility unless a disposal facility, then	10 CSR 25-7.011(2)(C)
not to exceed \$1,000)	

D-24 5 of 9 List all types of hazardous wastes to be managed at the facility.

NOTE: This list represents the estimated hazardous wastes to be shipped for 1983. Units (5) Estimated CODE sted Hazardous Waste or Process EPA OR (Gals., lbs. Quantity (4) (3) Description (1) tn., etc.) Per Month MOI DNR No. C 1.59 tn 0002 Waste Acid Solution E D007 MO Waste ID No. 001 C 8.87 tn_ 0002 2 Waste Acid Solution E 0007 MO Waste ID No. 003 1.78 E 0007 tn. 3 Waste Alkaline Solution MO Waste ID No. 005 0.02 tn. 0002 4 Waste Acid Solution D007 E MO Waste ID No. 007 0002 C 1.53 tn. Waste Acid Solution 0003 R MC Waste IC No. 008 C 0.19 tn. 0002 Waste Acid and Chlorinated Solvent F002 MO Waste ID No. 009 2.59 tn. 0002 Waste Acid Solution MO Waste ID No. 010 0007 0.15 tn. Waste Acid Solution 0002 DOOZ MO Waste ID No. 072 C . 0.05 tn. 0002 Waste Acid Solution 0007 MO Waste ID No. 013 0.02 tn. r 0002 Waste Acid Salution 0007 MO Waste ID No. 014 0.11 tn. Waste Acid Solution 0002 F 0007 MO Waste ID No. 015 tn. 0 02 = Waste Cadmium Stripping Solution D006 MO Waste ID No. 017 tn. 0.05 0002 Waste Acid Solution MO Waste ID No. 018 0007 tn. C 0.05 0002 Waste Acid Solution F MO Waste ID No- 020 0007 tn. 0.05 C 0002 15 Waste Acid Solution MO Waste ID No. 021 --tn. 0.03 C 16 Waste Acid Solution D002 MO Waste ID No. 022 0007 0.12C 0002 Y7 Waste Acid Solution MO Waste ID No. 023

Page (2)
DATE: 09 SEP 83
REVISION NO.: 1

Continued (Continue numbering with 35)

Listed Hazardous Wasta or Process Description (I)	EPA or MO DNR No.	CODE (3)	Estimated Quantity (4) Per Month	Units (5) (Gals., 1bs. tn., etc.)
Waste Alkaline Solution	0002	С	0.28	tn.
MO Waste ID No. 024	D007	E		·
Waste Alkaline Solution	D002	C	1.35	tn.
MO Waste ID No. 025	9006	E		
Waste Alkaline Solution	D003	R	0.07	tn.
MO Waste ID No. 026	0006	F		
Waste Acid Salution -	D002	C	0.09	tn.
MO Waste ID No. 027	0007	. F		7 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Waste Potassium Dichromate Solution	0007	F	1.17	tn.
MO Waste ID No. 028				
Waste Alkaline Solution	D007	F	1.73	tn.
MO Waste ID No. 029		-		
24 Waste Alkaline Solution	- 0007	F	T.54	tn.
MO Waste II No. 030	1.55			
Waste Ferric Chloride Solution	0002	C	0.88 -	tn.
MO Waste ID No. 03T	0007	F		
6 Waste Alkaline Solution	0007	. Ε	: 2.26	tn.
MO Waste ID No. 033		•		
7 Waste Acid Solution	0002	C	0.07	tn.
MO Waste ID No. 034				• .
8 Pretreatment Plant Sludge	F006	Т	285.73	tn.
MO Waste ID No. 036	F019			
9 Water Emulsified Cutting Oil	· listed		74.44	tn.
MO Waste ID No. 037	Waste			
30 Solid Hazardous Waste	0008	E	23.61	tn
MO Waste ID No. 038				
31 Waste Paint STudge	0007	E	7.11	tn.
MU Waste ID No. 040				-
	F001	Т	10.94	tn
32 Waste Chlorinated Solvents	F002	T		
MO Waste ID No. 041 Waste Solvents	F003	· T	12.33	-tn
MO Waste ID No. 043	1.550			
7-		E	0.88	tn.
34 Waste Metal Cutting Coolant	<u> </u>	-		

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Continued
(Continue numbering with 35)

EPA or MO DNR No. D008 F002 D002	CODE (3)	Estimated Quantity (4) Per Konth 0.44	Units (5) (Gals., lbs., tn., etc.) tn.
MO DNR No. D008 F002 D002 MKT3	F T	Per Konth 0.44	tn., etc.)
F002 0002 MKT3	T C	0.44	tn.
F002 0002 MKT3	T C		
D002 	C	0.30	tn.
 MKT3		0.30	tn.
MKT3		•	
		0.81	tn.
F 0004	E	0.23	+n
		i.	
0002		0.27	tn
		-	
-		0.57	tn.
0002	C	4.77	tn
0002	C	0.07	tn
1006	Ε		
0006	E	0.34	tn.
0002	С	2.08	tn
DOGG	Ε.		
		2.15	tn
		0.55	tn
		0.55	
	_	1.42	-
		1.42	tn
0006			
0002		0.34	-tn
0003			
0002	10	0.02	tn
0006	E		
D002		1.62	tn
	Ċ	1.86	tn
	D002 Listed Waste D002 D006 D006 D006 D002 D006 D006 D006 D006	D002 C Listed	D002 C

STORAGE FACILITY

DATE: 09 SEP 83 REVISION NO.: 1

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(D)

Did the department conduct a preliminary site investigation? Yes | No

2. Any application for a hazardous waste storage facility must include the following information:

As Required By

A. General Rules Applicable to all Facilities

10 CSR 25 7.011

B. Storage in Containers and/or

C. Storage in Tanks

10 CSR 25 7.050(3) 10 CSR 25 7.050(4)

3. List the type(s) of storage to be utilized at the facility.

Above G	round Tanks	Cont	ainers	Und	rground Tanks
	Capacity	Number	Capacity	Numi	per Capacity
13	27,000 gar.		P. 705 gal	7	19,760 gal
#1	120,000 gal.	7	35,915 gal.	3.5	
. S		- 7	30,300 gal.	-	
		090		# · · · · · · · ·	313

In ground

Engineer's Certification

This is to certify that this application has been prepared to comply with the Missouri Missouri Hazardous Maste Management Law and all applicable standards, rules, and regulations for hazardous waste storage facilities, specifically 10 CSR 25 7.050. It is my understanding that this facility has been designed to provide adequate protection of the health of humans, and other living organisms.

Registered Professional Engineer Submitting Plans

Name	Earl M. Myers	Phone (314) 232-2379
Name of C	Consulting Firm Plant Er	gineering Design Department
Address _	P.O. Box 516	
City	St.Louis	State MO Zip Code 63166
Signature	Tol m m	Registration No. E-8041 Date 1-14-83
5.	Appl	icant's Certification
Onformation of those	ion submitted in this do individuals immediately	hat I have personally examined and am familiar with the cument and all attachments and that, based on my inquiry responsible for obtaining the information, I beliave that e, and complete. I am aware that there are significant nformation, including the possibility of fine and
imprison	ment. Signature	Date 17 JAN. 1983
	- Cimptura McDannal	Douglas Corporation Date

D-2c Tank Management Practices

The two - 10,000 gallon waste sodium hydroxide storage tanks (Figure D-4) are equipped with level indicators. When the tanks have accumulated 6,000 gallons, a 4,000 gallon removal request is initiated. This removal is accomplished within 24 hours of the initial request. A pH sensor, located in the industrial waste water sewer that drains this area will detect, alarm and record any leaks.

The five - 500 gallon waste nitric and hydrofluoric acid storage tanks (Figure D-5) are located immediately adjacent to the building where this waste solution is generated. A Maintenance Department pipefitter is assigned to this area of the facility full time on the first shift. This pipefitter and the Production Department supervision maintain surveillance over these tanks. The pipefitter has received hazardous waste handling training. The pipefitter is responsible for maintaining storage capacity in these tanks by operating a lime/pH adjustment system. The process tanks, waste storage tanks, and pH adjustment system are connected by piping. The effluent of the pH adjustment system is connected to the industrial waste water sewer. The pH sensor mentioned above also serves this area.

The six - 750 gallon waste nitric and hydrofluoric acid storage tanks (Figure D-6) are also located immediately adjacent to the building where this waste solution is generated. A Maintenance Department pipefitter is assigned to this area of the facility full time on the first shift. This pipefitter and the Production Department supervision maintain surveillance over these tanks. The pipefitter has received hazardous waste handling

training. The pipefitter is responsible for maintaining storage capacity in these tanks by operating the lime/pH adjustment system. The process tanks, waste storage tanks, and pH adjustment system are connected by piping. The effluent of the pH adjustment system is connected to the industrial waste water sewer. The pH sensor, mentioned above also, serves this area.

The one - 3,000 gallon waste turbine engine (Jet Aircraft) fuel and hydraulic fluid storage tank (Figure D-7) is located underground immediately behind the set of three buildings identified as hush houses. Each hush house will hold a single military aircraft. With the hush house doors closed, the aircraft engines may be operated at maximum output. Spillage during this operation enters the 3,000 gallon waste tank. In addition, spillage, from other areas, is manually added to this tank. A Maintenance Department employee checks the fluid level each workday. When the tank has accumulated 2,000 gallons, a removal request is initiated. This removal is accomplished within 24 hours of the initial request. A leak detection system has been installed. Refer to Section D-2a.

The one - 2,000 gallon waste turbine engine (Jet Aircraft) fuel storage tank is located underground at the site where fueling and defueling, occur (Figure D-8). This tank is also checked each workday by the Maintenance Department to determine the volume of its contents. When the tank has accumulated 1,000 to 1,500 gallons, a removal request is initiated. This removal takes place within 24 hours of the initial request. See Section d-2a for information on the leak detection system.

The one - 2,000 gallon waste turbine engine (Jet Aircraft) fuel and hydraulic fluid storage tank is located underground at an engine silencer

area (Figure D-9). Spillage during engine adjustments accumulate in this tank. A Maintenance Department employee checks the fluid level each workday. When the tank has accumulated 1,000 to 1,500 gallons, a removal request is initiated. Removal then occurs within 24 hours. See Section D-2a for information on the leak detection system.

The one - 5,000 gallon waste jet aircraft fuel storage tank is located underground adjacent to a building that evaluates aircraft fuel handling systems (Figure D-10). Any leaks or spills that occur are conducted into this tank. The tank level is measured once each workday. When this tank has accumulated 2,000 or more gallons, a removal request is initiated. The removal then occurs within 24 hours. See Section D-2a for information on the leak detection system.

The one - 1,000 gallon waste oil tank is located underground adjacent to a central maintenance building (Figure D-11). The oil enters this tank via an oil/water separator, with the water being diverted to a sanitary sewer. The tank oil level is checked each workday by the Maintenance Department. Whenever the level exceeds 500 gallons a removal is performed. This occurs within 24 hours of this removal request. See Section D-2a for leak detection system information.

The one - 120,000 gallon tank is located inground at our industrial waste water pretreatment plant (Figure D-12). This tank accumulates water insoluable sludge. A pretreatment plant operator is assigned to this area on first shift. This operator collects sludge and pumps it to this storage tank. The same operator also operates a centrifuge for dewatering this stored sludge. The dewatered sludge is removed whenever the collection container is filled. The water returns to the treatment plant. The

operator requests removal service based on his operational activities. Refer to Section D-2a for additional information.

- D-3 Waste Piles [40 CFR 122.25(b)(4)][(10 CSR 25-7.060(3)]

 No waste piles exist at this facility.
- D-3a Piles With Free Liquids
- D-3a(1) Control of Wind Dispersal

 Does not apply since no waste piles exist at this facility.
- D-3a(2) Control of Run-on See section D-3a(1).
- D-3a(3) Collection of Leachate and Runoff See section D-3a(1).
- D-3a(4) Foundation

 See section D-3a(1).
- D-3a(5) Waste Pile Base

 See section D-3a(1).
- D-3a(5)(a) Containment System Design See section D-3a(1).
- D-3a(5)(b) Leachate Detection, Collection, and Removal System See section D-3a(1).
- D-3a(6) Ground Water Table Control

 See section D-3a(1).
- D-3a(7) Vegetation and Rodent Control
 See section D-3a(1).
- D-3a(8) Equipment and Procedures for Waste Pile Movement See section D-3a(1).

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- D-3b Waste Piles Without Free Liquids
 See section D-3a(1).
- D-4 <u>Surface Impoundments</u>

Does not apply since no surface impoundments exist at this facility.

D-5 Incinerators

Presently, MDC - St. Louis does not manage an incinerator, therefore, Section D-5 is not applicable.

ISSUED: 3 SEP 1981 REVISED: 18 SEP 1982

ATTACHMENT D-1

OPERATIONS MANUAL

HAZARDOUS WASTE STORAGE FACILITIES

TRACT I

A. PURPOSE

To establish a safe, orderly, effective method for operating the hazardous waste storage facilities (Tract I) that will prevent, reduce, or eliminate pollution to the environment through good hazardous waste management practices.

B. SCOPE

This procedure covers all hazardous wastes (acids, alkalis, caustic, oils, solvents, jet fuel coolants, etc.) that are held in hazardous waste storage facilities, prior to removal for final disposal.

C. EQUIPMENT AND MATERIAL

- 1. Drum, fifty-five (55) gallon, with polyethylene liners, new, or used and triple rinsed. (DOT 37M)
- 2. Drum, fifty-five (55) gallon, mild steel, new, or used and triple rinsed. (DOT 17E and 17H)
- 3. Carboy, five (5) gallon, polyethylene, new, with cardboard carton. (DOT 2U carboy and DOT 21P carton)
- 4. Container, one (1) gallon, polyethylene.
- Pump, transfer, portable acid resistant.
- 6. Wrench, Bung.
- 7. Caddy-Drum for fifty-five (55) gallon drum.
- 8. Truck Fork lift.
- 9. Attachment Drum lift, for fork lift truck.
- 10. Trailer Flatbed, eight (8) wheel, with either sideboards or safety chains.
- 11. Tank Mobile, stainless steel, unlined, five hundred (500) gallon capacity.
- 12. Tank Mobile, stainless steel, chlorobutyl line, one thousand (1,000) gallon capacity.
- 13. Soda Ash Commercial grade. (Material Code No. 183-32180 100# bags)

C. EQUIPMENT AND MATERIAL (CONTINUED)

- 14. Oil Absorbent compound. (Material Code No. 185-31516 50# bags)
- 15. SAFETY EQUIPMENT
 - 15.1 Safety clothing, P.V.C., consisting of jacket and pants.
 - 15.2 Chemical goggles or face shield.
 - 15.3 Boots rubber, over-the-shoe type.
 - 15.4 Gloves rubber, plastic, or acid resistant.
 - 15.5 Respirator Protects against acid gases alone or in combination with organic vapors. See Key No. 1.4 of Air Purifying Respirators Personal Protective Devices manual. If mists are encountered, add pre-filter and clamp (see Key No. 1.5).
 - 15.6 Apron acid resistant.

D. GENERAL

1. REFERENCES

- 1.1 Manufacturing Methods Procedure No. 37.10 Chemical Solutions Vendor Tank Truck Delivery and Removal of.
- 1.2 Manufacturing Methods Procedure No. 37.17 Removal of Small Quantities of Chemical Waste.
- 1.3 Process Specification No. 20002.1 Safety Information on Hazardous Materials (Small Quantities).
- 1.4 Process Specification No. 20002 Safety Standards, Handling of Hazardous Materials.
- 1.5 Safe Practice Procedure 50.10 Labeling Shop and Inter-Building Containers.
- 1.6 Standard Maintenance Procedure No. 190-70-2 Removal of Small Quantities of Hazardous Waste.
- 1.7 Standard Maintenance Procedure No. 190-70-10 "SPCC" Spill Prevention, Control, and Countermeasure Plan; Contingency Plan; and Reporting Spills of Oil and Hazardous Materials.

D. GENERAL (CONTINUED)

2. STORAGE SITES

- 2.1 There are eleven (11) hazardous waste storage facilities at MDC-St. Louis (MCAIR). These are identified as follows:
 - 2.1.1 Bldg. 6 oil interceptor underground receiver tank.
 - 2.1.2 Bldg. 10 explosive waste storage.
 - 2.1.3 Bldg. 14 sludge storage tank.
 - 2.1.4 Bldg. 27 scrap dock (two drum storage areas*)
 - 2.1.5 Bldg. 28 fuel interceptor underground receiver tank.
 - 2.1.6 Bldg. 52 titanium etch storage tanks.
 - 2.1.7 Bldg. 52 steel chem-mill storage tanks.
 - 2.1.8 Bldg. 52 aluminum chem-mill storage tanks.
 - 2.1.9 Flight Ramp fuel pit #3, spill receiver tank.
 - 2.1.10 Flight Ramp F-18 engine test cell, underground receiver tank.
 - 2.1.11 Flight Ramp hush house interceptor underground collection tank.
 - * NOTE: Bldg. 27 scrap dock drum storage area consists of two separate storage areas.
 - Area No. 1 Divided in two categories by a six inch high curb and each has a sump to accumulate any leakage that occurs. Acids and bases in one side and oils, solvents and paint sludges in the other side.
 - Area No. 2 For cyanides and sulfides. It has a sump to accumulate any leakage that occurs.

D. GENERAL (Continued)

- REGULATIONS DRUM STORAGE FACILITY
 - 3.1 All waste must be in closed DOT specification shipping containers and all containers of hazardous waste shall be inspected, labeled, and sampled by Dept. 191C, Environmental Pollution Control, before they are removed from the generating area and taken to the hazardous waste storage facility.
 - 3.2 Containers of hazardous waste must be taken to the storage facility only from 9:00 a.m. to 11:00 a.m. and 1:00 p.m. to 3:00 p.m. The operator will be on duty there to receive the material during these times.
 - 3.3 When drums of hazardous waste are being handled with a fork lift, the drums must be either on a skid or the fork lift must be equipped with a special drum lift attachment to prevent damaging the drums. DO NOT LIFT A DRUM WITH JUST THE FORKS ALONE.
 - 3.4 Drums shall be positioned in rows, two drums wide with a minimum of eighteen inches of space between rows. The aisle between double rows of drums must always be maintained to allow for an inspection for leaky containers.
 - 3.5 Five-gallon carboys must be packed in a cardboard carton, taped closed, and stacked on a skid.
 - 3.6 The operator shall make an inspection of the facility each working day to check for leaky or damaged containers, and for an accumulation of material in the sump. Any spill or leak must be corrected immediately. The material from a leaky container shall be transferred to a DOT specification shipping container. If the sump has an accumulation in it, locate and stop the source of the accumulation. Collect a sample and have a laboratory analyze it to identify it. Then transfer the material to an appropriate DOT shipping container.
 - 3.7 In the event of a pollution emergency, the first person discovering the emergency shall notify the Fire Department at inplant telephone number 22611 and the Guard Headquarters at inplant telephone number 22821.
 - 3.8 The operator shall immediately report any explosions, fires, spills, unusual damage from weather conditions, and any discharges or releases of hazardous waste to Environmental Pollution Control (inplant telephone number 23319), who will be responsible for notifying the necessary regulatory agencies.

- REGULATIONS DRUM STORAGE FACILITY (CONTINUED)
 - 3.9 If the waste is generated in Tract I, the waste may be accepted at the storage facility without a manifest. If the waste is generated in Tract II, III, Bldg. 72, 75, 78, 81, 82, 90-91-92-93, 250-251-252, or 270, the waste must be accompanied by a properly prepared hazardous waste manifest and Hazardous Materials Control (D. 790) must authorize the over-the-road movement. The operator shall acknowledge receipt by signing the manifest.

4. REGULATIONS - BULK TANKS

- 4.1 Bulk tanks are divided into two categories above ground and underground. These tanks are connected to specific waste generating sources and accumulate waste in sufficient quantity to be removed by over-the-road vehicles.
- 4.2 The operator shall make an inspection of the above ground tanks each working day. He shall also make an inspection of the leak detection systems for the underground tanks each working day. Corrective action must be initiated immediately for any spill or leak.
- 4.3 In the event of a pollution emergency, the first person discovering the emergency shall notify the Fire Department at inplant telephone no. 22611 and the Guard Headquarters at inplant telephone no. 22821.
- 4.4 The operator shall immediately report any explosions, fires, spills, unusual damage from weather conditions and any discharges or releases of hazardous waste, to Environmental Pollution Control (23319), who will be responsible for notifying the necessary regulatory agencies.
- 5. REGULATIONS EXPLOSIVE STORAGE

(See attached Operations Manual for explosive waste storage provided by Dept. 790, Hazardous Materials Office, Material Division.)

6. REGULATIONS - RECORD KEEPING

The following records shall be maintained for at least three years:

- 6.1 Permit and approved plans. (Dept. 1910)
- 6.2 Training records showing who has been trained and is knowledgeable of proper hazardous waste management procedures. (Dept. 063)

 NOTE: Training records will be maintained until closure of the facility. Training records on former employees will be kept for three years after termination.

- REGULATIONS RECORD KEEPING (CONTINUED)
 - 6.3 A copy of each manifest for waste received. (Dept. 191C)
 - 6.4 A log which records the quantities of wastes received and dispatched from the facility. (Dept. 1910)
 - 6.5 A manifest log which records the manifest number associated with each waste received and the disposition of that waste. (Dept. 191C)
 - 6.6 Copies of any waste analysis. (Dept. 1910)
 - 6.7 A log of visual inspections performed, corrective action taken and maintenance performed. (Dept. 191C)

NOTE: A copy of MAC Form 4445A "Hazardous Waste Storage Facilities - Daily Inspection Log - Tract I" is attached to this manual.

OPERATING RESPONSIBILITIES

- 7.1 Hazardous Waste Storage Facility Operator
 - 7.1.1 Oversee all activities in the storage facility.
 - 7.1.2 Accept hazardous waste from Tract I only if it has been properly packaged, labeled, and sampled.
 - 7.1.3 Accept waste from Tract II, III, Bldg. 72, 75, 78, 81, 82, 90-91-92-93, 250-251-252, or 270 if it is properly packaged, labeled, sampled, and accompanied by a properly prepared hazardous waste manifest. Sign the manifest to acknowledge receipt of the waste.
 - 7.1.4 Conduct a visual inspection of the storage facility each working day to check for damaged, deteriorated or leaking containers. Transfer waste from any of these containers to good containers.
 - 7.1.5 If there is an accumulation of material in the sump, locate and stop the source, then collect a sample and have it analyzed at a lab and transfer the material to an appropriate DOT specification shipping container.
 - 7.1.6 Forward copies of manifests, inspection logs, waste analysis, etc. to Environmental Pollution Control, where they will be maintained in a file for three years (Dept. 191C file).

7. OPERATING RESPONSIBILITIES (CONTINUED)

7.1.7 The Operator shall immediately report to Environmental Pollution Control (23319) any explosions, fires, spills, unusual damage from weather conditions, and any discharges or releases of hazardous waste.

7.2 Maintenance

- 7.2.1 Move drums of hazardous waste from the generating department only after being authorized by Dept. 191C, Environmental Pollution Control.
- 7.2.2 Organize the drums in the storage facility as directed by the Operator.
- 7.2.3 Transfer the contents of a leaking, damaged or deteriorated container or the sump to a proper container as requested by the Operator.
- 7.2.4 Handle drums only on skids or with special drum lift attachment. NEVER MOVE A DRUM WITH STANDARD LIFT TRUCK FORKS.
- 7.2.5 Dept. 192A assign one Machine Equipment Operator (MEO) driver and laborer to work full time with the operator at the drum storage facility.

7.3 Environmental Pollution Control

- 7.3.1 Obtain Storage Facility Permits.
- 7.3.2 Prepare hazardous waste manifests when required.
- 7.3.3 Provide hazardous waste storage facility operator.
- 7.3.4 Maintain records for a minimum of three years.

7.4 MCAIR Personnel Training

7.4.1 Provide training for maintenance supervision storage facility operator, and maintenance pipefitters, equipment operators, and laborers, shipping personnel, fire service and Security Guard service personnel.

Prepared by: R. J. Linzmaier, Sr. Engineer Environmental Pollution Control Dept. 1910 Approved by: V. C. Patterson, Section Manager Environmental Pollution Control Dept. 1910 Approved by: T. W. McMahon, Branch Manager Environmental Pollution Control Dept. 1910 Approved by: (are E. M. Myers, Manager, Tant Design Engineering Plant Engineering Dept. 190 Approved by: L. E. Page, General Superintendent, Maintenance, Plant Engineering Dept. 190 Approved by: R. D. Singleton, Director Plant Engineering

Dept. 190

Issued: 23 Sep 82

McDonnell
Douglas
Corp. - St. Louis

OPERATIONS MANUAL

Hazardous Waste Storage Facility
Tract I Explosive Waste Storage

A. Purpose

To establish a safe, orderly, and effective method for operating the hazardous explosive waste storage facility that will prevent and eliminate pollution to the environment through good hazardous waste management practices.

B. Scope

This manual covers explosive waste that is stored in the Bldg. 10 explosive hazardous waste magazine facility and the removal for treatment, storage or disposal.

C. Required Equipment

- 1. Internal communications system
- 2. Alarm telephone
- 3. Safety equipment
 - 3.1 Fire extinguisher
- 4. D.O.T. specification containers and closure equipment
- 5. Material handling equipment, nonsparking

D. General

1. References

- 1.1 Process Specification 16040 Identification of Nonammunition Explosive Components
- 1.2 Process Specification 20113 Care, Handling, and Storage of Explosive and Pyrotechnic Systems

Storage Site

2.1 MDC Bldg. 10 "Gun Range"

- 3. Regulations Waste Explosive Storage Facility
 - 3.1 All waste must be in proper D.O.T. shipping containers that are properly marked and labeled. Containers shall be inspected by Dept. 790 Operator to insure compliance with company and governmental regulations.
 - 3.2 The operator will make a weekly inspection of the facility. Checks will be made on:
 - 3.2.1 The doors for integrity of closure;
 - 3.2.2 Fire extinguisher for degree of charge;
 - 3.2.3 Storage containers for damage;
 - 3.2.4 Alarm/surveillance system for functionality;
 - 3.2.5 Fences and gates for integrity.
 - 3.3 In the event of an imminent emergency, e.g. fire, telephone fire services (Telephone No. 22611) and security (Telephone No. 22821). Otherwise contact Dept. 790 for direction.
 - 3.4 Explosives will be stored on shelving or other devices in order to keep any explosives off of the floor by eighteen inches. This is required since this Bldg. is only 0.7 feet above the 100 year flood plain.
- 4. Regulations Record Keeping

The following records must be kept for at least three years:

- 4.1 Permit (Environmental Pollution Control)
- 4.2 Training records showing who has been trained in explosives (hazardous waste) management. Training records are maintained as described in Section "H" (Personal Training Paragraph H-2).
- 4.3 A copy of each manifest. (Environmental Pollution Control)
- 4.4 A log showing quantities of wastes received and shipped from the facility. (Hazardous Material Control)
- 4.5 A manifest log showing manifest number associated with each waste received and disposition of that waste. (Environmental Pollution Control)

- 4.6 A log of visual inspections and final disposition of corrective actions initiated to correct any deficiencies discovered. (Hazardous Material Control)
- 5. Operating Responsibilities

The explosive (hazardous) waste storage operator will perform the following:

- 5.1 Oversee all activities relating to storage of explosive wastes.
- 5.2 Conduct a visual inspection of the storage facility as required by company and governmental regulations and forward a copy of this inspection monthly to Environmental Pollution Control.
- 5.3 Assure that any discrepancy discovered as a result of the inspection is corrected in an expeditious manner.
- 5.4 Assure that explosive waste is properly shipped in accordance with applicable company and governmental regulations to an authorized treatment or disposal facility.

DATE: 6 OCT 1982 REVISION NO.: 0 (E)

SECTION E

GROUND WATER MONITORING SYSTEMS

The requirements for Ground Water Monitoring Systems do not apply to the McDonnell Douglas, St. Louis Tract I Storage Facility, since this facility is not classified as a Disposal Facility.

Date: 6 Oct 1982
Revision No.: 0
(F)

SECTION F

PROCEDURES TO PREVENT HAZARDS

The information provided in this section is submitted in accordance with the requirements of 40 CFR Part 122.25(a)(4), (5), (6), (8), and (9) plus 10CSR25-7.011 (2)(c); (3)(d)(e); (4); (7). Other regulations addressed to complete this section include 40 CFR §264.14, §264.15, §264.17, §264.174, §264.194, and §264.254.

McDonnell Douglas Corp. - St. Louis (MDC - St. Louis) will address the following subject areas (referenced above): general security provisions; inspection schedule; request for a waiver of preparedness and prevention requirements; spill prevention, containment, and countermeasures plan; and prevention of accidental ignition or reaction of ignitible, reactive, or incompatible wastes.

F-1 Security

F-la Security Procedures and Equipment

In addition to the general security provisions of fencing, gates, and guards discussed below, several other features contribute to the safety and security of the facility. Ample lighting is provided throughout the site, and roving guards in automobiles equipped with two-way radios systematically patrol the area and are instructed to report upset conditions immediately. All buildings are equipped with a central public address system controlled by the switchboard of our telecommunications department. The internal telephone system for our Metropolitan St. Louis area complex consists of more than 20,000 telephone numbers. A significant amount of these telephone numbers and instruments are located throughout the storage facility area. This same telephone system is used for external communications throughout the 48 United States via the McDonnell Voicenet system.

Date: 6 Oct 1982 Revision No.: 0

All employees, contractors, and visitors are required to wear identification badges while on company property. These badges are color coded to identify the various work functions and also indicate the level of Department of Defense Security Clearance that the wearer possesses.

F-1A (1) 24-Hour Surveillance System

Security at MDC-St. Louis is maintained by our own Security Guard Services force of more than 225 people. Security guards are constantly on duty. They are classified as licensed private watchmen by the St. Louis County Police Department and have authority to arrest as would commissioned officers of the St. Louis County Police Department. All Security Guards carry side arms.

Several building entrances and gates are located at this facility. Entrance is controlled by either an armed guard or lobby receptionist (locked door). Both are members of our security department. These entrances are all normally open during first shift. During second and third shifts, weekends and holidays at least one entrance gate is operational. The Security Guard Services headquarters is located in this facility. For reasons of general plant security, a roving security guard, in a two way radio equipped automobile, makes systematic inspections 24 hours per day.

In addition, MDC-St. Louis has its own Fire Services which consists of at least eight firemen and one officer on duty at any given time. This Fire Services has a "Pre-Fire Plan" (Attachment F-1) that defines the specifics of what is stored at this facility, where the fire hydrants are located, what action is to be taken by firemen and security guards in the event of a fire, and what backup community Fire Departments are to be called, if necessary.

Date: 6 Oct 1982 Revision No.: 0 (F)

F-la (2) Barrier and Means to Control Entry

F-la (2) (a) Barrier

The entire facility, including company parking lots, is enclosed within an 8-ft-high chain link fence topped by three strands of barbed wire. Gates allowing vehicular entrance monitored by Security Department guards.

F-la (2)(b) Means to Control Entry

As discussed in Section F-la(1), entry to the facility is controlled by either armed security guards stationed at the entrance gates and locked doors controlled by Lobby Receptionists. Employees are required to wear identification badges all of the time at work. Contractors are also required to obtain and wear badges while on company property. Visitors are only allowed to enter this facility after being sponsored by an existing employee and approved by the Security Dept. Visitors receive a daily visitor badge which requires that the visitor be escorted by an employee at all times.

F-la (3) Warning Signs

Signs which are legible from a distrnace of 50 feet are posted at all Hazardous Waste Storage areas of the facility; these signs bear the legend "Danger - Unauthorized Personnel Keep Out." Also, "No Smoking" signs which are legible for a distance of 50 feet have been placed in the container storage area.

F-1b Waiver

The MDC-St.Louis does not request a waiver of the requirements stated in Part 264.14(a)(1) and (2) regarding injury to intruder and violation by intruder.

F-2 Inspection Schedule

F-2a General Inspection Requirements

The MDC-St. Louis conducts regular inspections of the facility for equipment malfunctions, structural deterioration, operator errors, and discharges that could cause or lead to the release of hazardous waste constituents and

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F-2a (Continued)

adversely affect the environment or threaten human health (Figure F-1).

F-2a(1) Types of Problems

Figure F-1 is the daily log for inspecting monitoring equipment, security devices, operating and structural equipment in the contained storage areas and the tank storage areas.

F-2a(2) Frequency of Inspection

All storage areas at this facility, except for Bldg. 10 Reactive (explosive), are inspected on each workday. The reactive (explosive) storage area is inspected weekly. Our Fire Services Department, in conjunction with the Plant Engineering Fire Protection Engineering and Insurance section, conducts periodic inspections and performs Preventative Maintenance (P.M.) on all fire protection equipment, alarm systems, etc., in accordance with the inspection requirements of our insurance carrier. These inspections, etc. are performed using inspection forms (Figures F-3 and F-4).

F-2b Specific Process Inspection Requirements

F-2b(1) Container Inspection

Inspections of the container storage area are conducted per the inspection schedule provided in Figure F-1. Results of each inspection are recorded on this inspection log sheet. Information required on the log sheet includes the inspector's signature, name, and date of inspection, area of inspection, and discrepancies. The inspector is required to check the Container Storage Area.

DAÍLY INSPECTION LOG - TRACT I MDC ST. LOUIS

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Figure F-1, Page F-5 1 of 4

⁼ INDICATES FACILITY INSPECTED - DISCREPANCY NOTED

DAILY INSPECTION LOG - TRACT I MDC ST. LOUIS

HAZARDOUS WASTE STORAGE FACILITIES

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FIXED FIRE PROTECTION INSPECTION RECORD

DATE: 09 SEP 83 REVISION NO.: 1 (F)

TRACT I NORTH

		1 (SE)	WEEK ENDING	19
DIE	NO.	SPRINKLER CONTROL VALVES	CHECKED BY	CONDITION
	•	BLDG 22	<u></u>	
	2423	NORTH CENTER OF BUILDING		
		BLDG 25		
	2414	WEST CENTER OF BUILDING		
		BLDG 27		
	2121	COL 5-MM DRY PIPE		
100	2122	COL 5-MM		
	2123	COL 5-MM		
	2124	COL 5-MM		
	2125	COL 5-MM		
	2126	COL 13-MM		
	2127	COL 13-MM		
	2128	COL 17-MM		
	2131	COL 23-MM		
	2132	COL 23-MM		
	2133	COL 30-MM		
	2134	COL 30-MM		
	2135	COL 30-MM		
	2136	COL 30-MM		
	2137	COL 30-MM DRY PIPE		
	2141	COL 5-A		
	2142	COL 5-A	•	
	2143	COL 11-A		
	2144	COL 11-A		
	2145	COL 11-A DRY PIPE		
	2151	COL 17-A		
	2152	COL 17-A		
	2153	COL 21-A		
	2154	COL 21-A		<u></u>
	2164	COL 3-P BALC. PREACTION		
	2165	COL 15-0 BALC. PREACTION		
	•	BLDG 28		
	2431	SOUTHEAST CORNER DELUGE		
\rightarrow	2432	SOUTHEAST CORNER DELUGE		n e
	2433	SOUTHEAST CORNER WET		
		BLDG 29	6	
	2911	COL 4-K		
	2912	COL 1-G		G.
	2913	COL 1-F		
	2914	COL 1-E		
	2915	COL 1-C		
	2916	COL 1-8		
	2934	COL 11-G DELUGE WATER CURTAIN		
		BLDG_32		SÎ.
	1	LEV 1 BOILER RM		
		BLDG 33		
	1	BASEMENT SPRINKLER RM	1	
	2	4" OS & Y LEV 1 PRE-ACTION SPRINKLER		
1		BLDG 34		
	1	BLDG 33 BASEMENT SPRINKLER RM.		
		BLDG 39		П
	2441A	SOUTHEAST CORNER		
	2441B	SOUTHEAST CORNER DRY PIPE		0

DATE: 09 SEP 83 REVISION NO.: 1 (F)

ANNUAL IN-SERVICE APPARATUS TEST

TRUCK NO.	_			
RESIDUAL PRESSURE:		· 		
RATED CAPACITY:		@ 150 PSI		
10 MINUTE RUN @ 150 PSI:	GPM		RPM	
5 MINUTE RUN @ 200 PSI:	SPM		RPM	
5 MINUTE RUN @ 250 PSI:	GPM		RPM	
CARBURETION:		IGNITION:	<u>.</u>	
PUMP LEAKAGE:		CLUTCH SLIPPA	AGE:	
VACUUM TEST: INCHES OF MERCUR	RY:			
TIME HELD:				
REMARKS:			 	

F-2b(1) (Continued)

Daily: Check for leaking containers;

Check for deterioration of containers;

Check the sump for evidence of a spill;

Check and update the inventory of drums;

Check aisle space to be sure that aisles are not blocked:

Check to ensure that only empty drums are being stacked.

Weekly: Check integrity of containment curbs.

Explosives Storage Building

Weekly: Check perimeter fences and gates for integrity;

Check doors for integrity of closure;

Check fire extinguishers for degree of charge;

Check storage containers for signs of damage;

Check alarm/surveillance system for functionality.

If the status of a particular item is unacceptable, this condition is brought to the attention of the specific area Maintenance Department by issuing a Maintenance Work Order Request that asks for immediate corrective action.

F-2b(2) Tank Inspection

Tank inspections are conducted per the inspection schedule provided in Figure F-1. Results of each inspection are recorded on this inspection log sheet.

One 120,000-gallon Inground Tank

Daily: Check level of waste in the tank;

Check for evidence of a leak or spill around the tank.

R

R

R

F-2b(2) (Continued)

Weekly:

Check for cracks or deterioration of the concrete

R

tank wall.

Every Five Years:

Drain and rinse the tank. Check entire inside tank wall

and floor for cracks, spalling, and corrosion of the

concrete;

Check for corrosion of piping.

Two 10,000-gallon Above-ground Steel Tanks

Daily:

Check level of waste in the tanks;

R

Check for evidence of a spill or overflow;

Check external condition of tank.

Weekly:

Check integrity of containment curbs;

Check the tanks for leaks or evidence of cracks or

structural failure.

Annually:

Drain and rinse the tanks. Inspect the interior of the

R

tanks for evidence of cracks or structural failure.

Five 500-gallon Above-ground Polyethylene Tanks, Six 750-gallon Above-ground Polyethylene Tanks

Daily:

Check external condition of tanks;

R

Check area around tanks for evidence of a spill or leak.

Weekly:

Check the integrity of the containment curbs.

Monthly:

Check the condition of the interior of the tanks.

The underground tanks, all of which contain hydrocarbons, are monitored by a hydrocarbon sensing system that is installed in monitoring wells located adjacent to these buried tanks. The wells will be sampled on an annual basis unless and until history dictates more frequent sampling would be advantageous.

R

R

F-2b(2) (Continued)

One 3,380-gallon Below-ground Tank - Hush House

One 2,000-gallon Below-ground Tank - Fuel Pit #3

One 2,000-gallon Below-ground Tank - Fuel Pit #4

One 5,000-gallon Below-ground Tank - Bldg. 28

One 1,000-gallon Below-ground Tank - Bldg. 6

One 2,000-gallon Below-ground Tank - F-18 Silencer

One 4,380-gallon Below-ground Tank - Ramp Station 1 and 2

Daily:

Check the monitoring well control panel for an

indication of a leak;

Check surface above the tank for signs of a leak.

F-2b(3) Waste Pile Inspection

No waste pile storage exists at this facility.

F-2c Remedial Action

If inspections reveal that non-emergency maintenance is needed, it will be completed as soon as possible to preclude further damage and reduce the need for emergency repairs. If a hazard is imminent or has already occurred during the course of an inspection or at any time between inspections, remedial action will be taken immediately. MDC-St. Louis personnel will notify the appropriate authorities per the Contingency Plan and initiate remedial actions. In the event of an emergency involving the release of hazardous constituents to the environment, efforts will be directed toward containing the hazard, removing it, and subsequently decontaminating the affected area. Refer to the Contingency Plan for further details.

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F-2d Inspection Log

The inspection log is maintained in a three-ring binder. The inspection log notebook is always kept with the inspection instructions in the Environmental Pollution Control Section office. Records of inspections are kept for at least three years from the date of inspection as required by regulation.

F-3 Waiver of Preparedness and Prevention Requirements

The applicant does not wish to request a waiver of the preparedness and prevention requirements under 40 CFR §264 Subpart C.

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F3-a Equipment Requirements

Internal and external communications, emergency equipment, and fire control equipment are discussed in Section F-1 (Procedures to Prevent Hazards) and Section G (Contingency Plan).

F-3b Aisle Space Requirements

Aisle space requirements are addressed in Section F-5c of this section.

F-4 Preventive Procedures, Structures, and Equipment

F-4a Loading/Unloading Operations

Loading operations at the facility, other than removal operations at the container storage area and tank areas, takes place in the processing area. Except for tank storage wastes, wastes generated in the processing area are loaded into drums for transport to the appropriate storage area. During loading operations spills are unlikely; however, in the event of an accident the material will be contained with, standard industrial absorbents, or absorbent boom and pads. Contaminated materials will be disposed of at an EPA approved disposal facility, and affected areas of the facility and equipment will be decontaminated.

The areas that involve unloading operations at MDC-St. Louis are the container storage areas, the tank areas. Several precautions have been taken to reduce the potential for hazards during unloading operations in the container storage areas. First, the front curb is designed as a ramp to facilitate the smooth and accessible movement of a forklift truck in and out of each of the storage area section. Second, a minumum of 18 inches of aisle space is maintained at all times. Third, pallets are used in the transport of drum containers. Fourth, when drums are being handled with a fork lift, the fork lift must be equipped with a special drum lift attachment to prevent damaging the drums.

The precautions taken to reduce the potential of Hazards during unloading

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F-4a /Continued/

operations of storage tanks are the following. First, the receiving vehicle is inspected to verify that it complies with DOT regulations. This includes determining that the materials of construction are compatable with the waste to be transported. Second, the receiving vehicle is inspected to verify that it is empty. Third, the contractor's (hauler) paperwork instructions must match the manifest in respect to this material being handled. Fourth, a representative from the area maintenance department (pipefitter) and a representative from the shipping department (Hazardous Materials Office) are present during the actual Hazardous Waste transfer. These people have received specialized training pertaining to Hazardous Waste handling.

F-4b Runoff

There is no runoff from the container storage areas because they are covered with roofs and have containment curbs and sumps to trap any leaks. Sump accumulations are sampled and tested to identify contents. The accumulation is then transferred to an appropriate DQT shipping container and labled. The above ground tanks are all confined with curbs and drains to our industrial waste water pretreatment plant. The reactive (explosive) storage area is inside of a building which is weather proof. The runoff from the area above the buried storage tanks drains through a storm sewer system into Coldwater Creek. This storm sewer system normally conveys uncontaminated non-contact cooling water that is regulated under the terms of NPDES Permit No. MO-0004782.

Because this storage facility is NOT located in a 100 year flood plain, no procedures concerning floor occurrence have been developed.

F-4c Water Supplies

Ground water contamination is prevented by eliminating the discharge of hazardous materials onto the unprotected ground. The container storage areas are constructed of a concrete base with asphalt overlay, dikes, and

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F-4c /Continued/

sumps to contain leaks, spills and precipitation. The reactive (explosive) storage area is inside of a weatherproof heated and air conditioned building. This building is constructed of concrete block and the floor is poured concrete. Since this waste is solid, it cannot "flow" and enter ground water. The above ground storage tanks that contain acids or alkalis are all situated on asphalted surfaces. These tanks are surrounded with asphalt curbs. The area inside of the curbs is drained to our own industrial waste water pretreatment plant. This prevents ground water contamination from this area. The inground tank contains water insoluble industrial pretreatment plant sludge. This tank is constructed of poured concrete. The tank overflow returns to the influent of the waste water pretreatment plant. Ground water contamination from any leakage is prevented since this sludge is water insoluble. The remaining tanks are underground tanks and contain waste turbine fuel or oil. These tanks have adjacent monitoring wells that are equipped with a hydrocarbon sensing system that detects any hydrocarbons on the surface of the ground water table and provides an alarm in the area maintenance shop. Upon receipt of an alarm signal, investigation will commence to determine the cause and begin corrective action.

7-4d None of the storage areas or tanks are dependent on electric power for securing their contents. In the event of a power interruption, emergency generators will be started to maintain process operations; and the emergency lighting system will activate automatically supplying lighting for major buildings and property. If there is a prolonged power outage, the storage areas and tanks will be secured and all plant operations will be shut down.

F-4e Personnel Protection Equipment

General information on the major chemical components of the wastes in the container, tank, and explosive waste areas is provided in the MDC-St. Louis

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F-4e /Continued/

Fire Services "Pre-Fire Plan". This plan contains information on various chemicals being stored and what action is to be taken by firemen and guards in event of a fire. Protective equipment is presented under Emergency Equipment and Provisions of the Contingency Plan. Use of protective equipment is covered in the MDC-St. Louis Hazardous Waste Storage Facility - Operations Manual and Standard Maintenance Procedures 190-70-1 "Bulk Removal of Hazardous Waste Liquids" and 190-70-2 "Removal of Small Quantities of Hazardous Waste."

- F-5 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes
- F-5a Precautions to prevent Ignition or Reaction of Ignitable or Reactive Wastes Containerized waste is labeled and identified at the point of generation. It is packaged in the proper DOT container and then moved to the properly designated storage area according to the procedures in the "Hazardous Waste Storage Facility Operations Manual". The container storage area consists of two separate storage areas.
 - Area No. 1 Divided in two categories by a six-inch high curb and each has a sump to accumulate any leakage that occurs. Acids and bases in one side and oils, solvents and paint sludges in the other side.
 - Area No. 2 For cyanides and sulfides. It has a sump to accumulate any leakage that occurs.

The containers are compatible with the contained wastes; therefore, the only source of ignition is external to the containers. To prevent a possible source of external ignition, signs are placed in the container storage area clearly marked with the legends, "No Smoking" and "Danger - Unauthorized Personnel Keep Out."

F-5a /Continued/

The reactive (explosive) wastes are stored in an area solely used for containing explosives. Only Class "B" and "C" explosives are stored at this location. Signs are placed at this facility marked with the legends, "No Smoking" and "Danger - Unauthorized Personnel Keep Out."

This access to the underground tanks of waste turbine fuel or oil are marked with the legend "Danger - Unauthorized Personnel Keep Out." The waste tanks containing turbine fuel are located in general working areas where smoking is prohibited. The one waste tank that contains lubricating oil (hazardous waste by Missouri Regulations only) has a flash point greater than 1400F. It is buried in a general maintenance shop cleaning area which is subject to a minimal amount of pedestrian and no vehicular traffic.

- F-5b General Precautions for Handling Ignitable or Reactive Wastes or Accidentally Mixing Incompatible Wastes.
 - General precautions for handling ignitable or reactive wastes were discussed above. Incompatible wastes are not mixed at MDC-St. Louis.
- F-5c Management of Ignitable or Reactive Wastes in Containers Precautions taken in the container storage area to prevent accidental fire and explosion include the proper storage of containers (e.g., no stacking, adequate aisle space, and proper labeling and sealing of containers), dikes, sumps and appropriate warning signs.

Prior to storage, each container is closed and labeled. This prevents precipitation from entering the drum, and identifies the contents of the container and the date wastes were generated. Containers are stored in a shelter to minimize contact with precipitation. They are never stacked. The minimum of 18 inches is maintained in the aisles to allow access for daily inspection. Forklifts are only allowed to handle drums from the ends of

Date: 6 Oct 1982 Revision No.: 0 (F)

F-5C /Continued/

the rows. This reduces the risk of damaging containers by scraping or puncturing.

F-5d Management of Incompatible Wastes in Containers

All empty containers (drums or carboys) are issued by the Environmental Pollution Control section only after being informed of the waste by the generating department. The waste is identified and a compatible container is selected. After filling, the containers are closed, labeled and inspected prior to removal from the generating area.

This system prevents an operator from placing waste in a container that previously held an incompatible waste.

F-5e Management of Ignitable, Corrosive, or Reactive Wastes in Tanks.

Hazardous waste properties of storage tank waste materials, generated from manufacturing operations at MDC-St. Louis, are ignitability, corrosivity reactivity and toxicity.

All storage tanks are properly vented to prevent any pressure build-up. The facility provides for protection against explosions thru our Fire Protection Engineering Section and by operation of its own fire services and security services as previously mentioned in Paragraph F-la(1) of this section.

F-5f Management of Incompatible Waste in Tanks

Since waste materials held in tank storage are incompatible, each of the tank storage areas are completely isolated from each other. Regular inspections as discussed in section F-2b(2) are conducted to ensure safe operations.

F-5g Management of Wastes in Waste Piles

MDC-St. Louis does not store waste in waste piles. Therefore, this does not apply.



PRE-FIRE PLAN

MAY 1982

MCDONNELL AIRCRAFT COMPANY

Box 516; Saint Louis, Missouri 63166 - Tel. (314)232-0232

MCDONNELL DOUGL

CORPORATION

ATTACHMENT F-1



SYMBOLS USED IN LEGENDS

0	Hydrant w/o Steamer Connection	\oplus	Natural Gas Valve
\odot	Hydrant with Steamer Connection	•	Anhydrous Ammonia Valve
\succeq	Wall Hydrant	₩	Annunciator
	Hose Panel	GP	Gasoline Pump
0	Fire Dept Connection	АН	Anhydrous Ammonia
AS	All Automatic Sprinklered	FP	Fuel Pit
AS	Partial Automatic Sprinklered	FP	Fuel Pump
NS	Not Sprinklered	TR	Transformer Room
H	Hose Box	o	Pyrotechnic Storage
\Box	Fixed Ladder	9	Acids, Corrosives, Etc.
E	Elevator	H	Halon System
DW	Domestic Water	9	Fire Dept Connection in Stairwell
•	County Connection No. 8	+	Steam Shutoff
ES	Electric Shutoff	G	Natural Gas Meter

OTHER SYMBOLS USED IN MANUAL

FIRE TRUCKS	— → ANHYDROUS AMMONIA LINE
P PUMPER	MAIN AISLE
C CRASH	STAIRWELL (STAIRS, STEPS)
V VAN	X-X FENCE
DC DRY CHEMICAL	→ X— GATE
HOSELINE	OVERHEAD & HANGAR DOOR
FIRE	HIIIIIIIII RAILROAD TRACKS
NATURAL GAS LINE	NORTH SYMBOL
DUMPSTER/COMPACTOR	

ACKNOWLEDGEMENT:

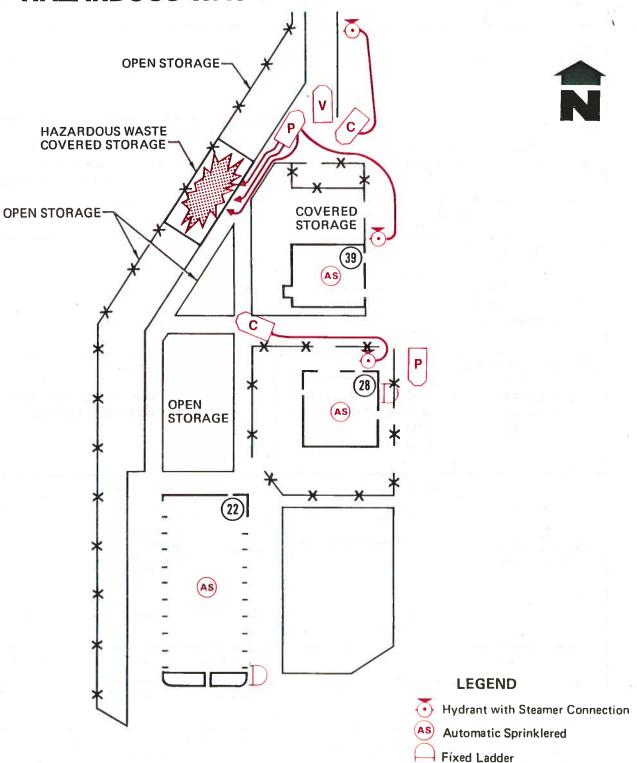
The symbols in the upper left hand column (except for the fixed ladder and those symbols below it) were derived from standard plan symbols of the National Fire Protection Association. Copyright of symbols furnished by Western Acturial Bureau, Chicago, Illinois. All other symbols were supplied by MDC.



BUILDING NO. HAZARDOUS WASTE OPEN STORAGE	NO.	OF LEVELS		AREA	RTH	QΟ		N IN AREA BLDG. 039	
FLIGHT LINE		, ,	17	\		SPRIN	NKLERED	YES NO X	
X OPEN STORAGE -					REAS NOT	SPRINKLERED			
P&L FACILITIES -									
OTHER -	1.0								
EQUIPMENT RESPONSE	1.	7 6	EXTERIOR STRUCTU			IRE INTERIOR STRUCTURE			
1ST (1) PUMPER (1) UTI 2ND (2) PUMPS (2) CRAS		OPEN STEEL STRUCTUR WITH SHEET AND METAL ROOF AND SIDING							
MUTUAL AID ST. LOUIS HAZELWO	NT				7 - 101 10 - 177 1 190				
HYDRANTS OR OTHER WATER SOURCE	3		LOCAT	ION		SPECIAL SYSTEMS			
HYDRANT NO. 9 HYDRANT NO. 10 HYDRANT NO. 11			NER BLDG.	ER BLDG. 028 ER BLDG. 039 PG. 027			:		
ADJACENT EXPOSURES	ADJACENT EXPOSURES LOCATION			HAZAR			ZARDS	RDS	
BLDG. 039 BLDG. 028 BLDG. 027	AST OF OPEN SHELTER DUTHEAST OF OPEN HELTER AST OF BLDG. 039		FLAMMABLE AND COMBUSTIBLE LIQUID CAUSTIC AND CORROSIVE LIQUIDS						
ACCESSIBILI'	TYOF	BUILDING		180	U	TILITIE	S CUT OFF		
APPROACHES		TERRAIN		UTILITY		LOCAT	ION	METHOD	
FROM NORTH FROM SOUTHEAST OF B 22 TO THE EAST	LDG	GRADUAL G	GRADE	ELECTRIC	OF!	IDE OF FICE RTH OF ELTER	SCRAP		
×	÷			GAS		NONI	E		
VENTILATION	ON PRO	OCEDURES		MATERIALS USED/STORED IN BUILDING OR AREA					
OPEN		VARIOUS INDUSTRIAL WASTE INCLUDING ACID,							
in at an in the wife in		BASES, PAINT SLUDGE AND OILS							
OCCUPANT CAPACITY OCCUPIED ONLY WHEN HANDLING MATERIAL				SPECIAL SEASONAL CONSIDERATIONS NORMAL					
OTHER PERTINENT DATA NOTIFY POLLUTION COM		OF ANY INCID	ENT OR A	ACCIDENT IN	IVOLVIN	G INDU	ISTRIAL WA	ASTE	



FIRE PROTECTION HAZARDOUS WASTE COVERED STORAGE





Hazardous Waste Covered Storage

TYPE OF BUILDING

One story covered shelter, unprotected steel structual members with sheet metal roof and North and South walls. East side of structure is open. Shelter is divided into 2 sections with 6" concrete work approximately 1/3 from South end. There is a 6" asphault curb on the East side of the shelter for spill containment. Both sections of the shelter have a sump of 150 gallons capacity for containment of spills.

FIXED FIRE PROTECTION

None in the shelter.

There are three fire hydrants in the immediate area.

Hydrant No. 9 Northeast corner of Bldg. 028.

Hydrant No. 10 Northeast corner of Bldg. 039.

Hydrant No. 11 West Center of Bldg. 027.

EXPOSURES

Bldg. 39 Approximately 50 ft. East of open shelter.

Bldg. 28 Approximately 150 ft. Southeast of open shelter.

RESPONSES (In event of spill)

(1) Pumper and (1) Utility Van (Station No. 1)

Action to be taken:

Contain spill area with use of dry sweep compound on the scene and utility van if necessary call for additional dry sweep to be brought from the ram area via dry sweep trailer. Locate origin of spill and upright leaking drum to prevent durther spillage. Make every attempt to prevent spill from entering sewer system.

Notify Pollution Control

RESPONSES (In event of fire)

1st Alarm

(1) Pumper, (1) Utility Van, Station No. 1

Pumper make straight lay from Hydrant No. 9, Northeast corner Bldg. 39 and position pumper on the North side of the shelter and attack fire with (2) 1 1/2 inch and (1) 2 1/2 inch lines using light water. Utility van position North of the shelter adjacent to pumper to supply light water.

2nd Alarm

(2) Crash Trucks, Station No. 1 and (2) Pumpers, Stations No. 2 and No. 3.

Crash truck 55 approach from the East between Bldgs; 28 and 39. Use turret to make frontal attack on the fire.

Crash truck 58 approach from the Northeast and position truck up grade from possible spill area and use turrent to attack the fire. Pumpers from Stations No. 2 and No. 3 to lay supply lines to crash trucks. Personnel from Stations No. 2 and No. 3 support 1st response pumper even in use of hand lines and resuppling 1st



Hazardous Waste Covered Storage (Cont)

Alarm pumper with light water. At the discretion of the Officer in charge 2nd Alarm pumpers could lay addition 2 1/2 inch lines to protect exposures or set up master stream applicances as necessary.

NOTE: Consideration should be given to use Fire Department pick up trucks to bring additional light water from Bldg. 002 to resupply apparatus on the scene.

3rd Alarm

Call City of St. Louis, Division No. 10. Request type of equpment needed.

MCDONNELL DOUGLAS

STANDARD

MAINTENANCE

PROCEDURE.

S.M.P. No. 190-70-13

TITLE: HYDROCARBON LEAK

DETECTORS FOR UNDERGROUND TANKS

EFFECTIVE: 25 JANUARY 1984

PLANT ENGINEERING

A. PURPOSE

To establish procedures and responsibilities for equipment operation

B. SCOPE

This procedure covers the operation and maintenance of the leak detectors associated with the storage of hazardous hydrocarbon wastes in underground tanks in Tract I.

C. EQUIPMENT AND/OR MATERIALS

- 1. Mallory "Pollulert" Hydrocarbon Detection System, consisting of an electronic control box, Model POL 101 bench mount
- 2. Mallory "Pollulert" Ground Water Probes, Model POL 204
- Mallory "Pollulert" Connecting Cable, Model POL 312
- 4. Monitoring wells, consisting of 6-inch I.D. Schedule 40 PVC pipe slotted (well casing)

D. GENERAL

- 1. The principle of operation is as follows.
 - 1.1 The Pollulert Hydrocarbon Detection System continuously monitors the thermal conductivity of the fluid surrounding the sensor. Thermal conductivity is the rate of heat transfer per unit area (calories/second, cm²) per unit temperature gradient (°C/cm). Hydrocarbon thermal conductivity is in the narrow range of .0003 to .0005, compared to .0013 for water and .00006 for air.
 - 1.2 The sensor consists of a semiconductor junction, which is heated by passing a constant current through it for a constant time period. The temperature of the sensor is then measured. It is then allowed to cool for another time period and again measured. The difference between these two temperatures is a function of the thermal conductivity of the surrounding medium. The cycle is then repeated.
 - 1.3 A microprocessor is used to perform the various operations of cycling, measuring, storing, and calculating. It is programmed to signal when a temperature difference corresponding to the thermal conductivity of hydrocarbon, air, or water is measured. Measurements are averaged over a number of cycles to assure against false signals.

1. 1.4 Long-term stability, even during extended power outages, is assured by providing a calibrated reference point in the form of a variable resistor, which is set during installation. If recalibration is needed, the electronic control is switched into the calibrate mode while the sensor is immersed in water. The microprocessor will automatically perform a 10-minute calibration cycle and will indicate a new setting of the variable resistor. Hydrocarbon is not needed for calibration.

2. Operating Instructions

- 2.1 On/Off switch should be on and calibrate monitor arrow should point to "Monitor."
- 2.2 Turn the Off/Loud control clockwise to place hydrocarbon alarm in standby condition. If hydrocarbon is detected at any sensor, the audible alarm will sound. Advancing the control further clockwise increases the audible output of the alarm. To turn off or defeat the alarm, turn the control counterclockwise until a click is heard. Sensor lamps, relay contacts, and 0 to 6 VDC output will continue to operate, even though the audible alarm is silenced.

2.3 <u>Interpreting Sensor Lamps</u>

- 2.3.1 Under normal operating conditions, all lamps should be off.
- 2.3.2 If hydrocarbon is detected at a sensor, the red sensor lamp will flash on and off.
- 2.3.3 If ground water probes should not float, but become dry, the yellow lamp will flash. The probes should be inspected to determine if the float has hung up and become high and dry or if the well has gone dry. It is not necessary that water be present; hydrocarbon that enters a dry well will be detected.
- 2.3.4 The cable to the probe is monitored by the Pollulert System. If, for some reason, the cable is severed, or the sensor should fail (open circuit), the yellow lamp for the sensor will light continuously.
- 2.3.5 Any change in the status of a sensor between the mediums of air-water-hydrocarbon will be indicated by the visual indicators after two to four minutes.

3. Operational Responsibilities

3.1 <u>Calibration - Maintenance</u>

3.1.1 The procedure for functional calibration is as follows. The leak detection system is checked for functional operation every 13 weeks. This functional check consists of removing each of the underground leak detection probes from their respective monitoring wells and placing each detector probe into a container of ethylene glycol. This simulates the detection of hydrocarbons in the monitoring well. A properly functioning probe causes a visual and audio alarm to occur. After the probe and alarm system are proven to be functional, they are marked with a Calibration Department seal that reflects the date and inspector's name.

Note: This functional calibration technique has been verified as being a valid functional check by Mr. Darryl Day of Pollulert Systems, Mallory Components Group, Indianapolis, Indiana [telephone (317) 856-3857].

D. 3. 3.1 3.1.2 Repair leak detection system.

3.2 Alarm Response

- 3.2.1 When an alarm sounds, the responsible Plant Engineering area supervisor will take the following action:
 - a. Record source of alarm;
 - b. Turn off audible alarm;
 - c. Inspect the area for evidence of leakage, tank rupture, spill, etc. If a problem is apparent, immediately begin action to stop the source, begin cleanup activities, and then notify Environmental Compliance; OR

If no cause for the alarm can be visually detected, report this condition to Environmental Compliance;

d. Contact Environmental Compliance as follows.

On Monday through Friday (8:00 a.m. to 4:30 p.m.), telephone Sta. 23319, Environmental Compliance, and report the alarm situation.

On all other times (including holidays), contact the MDC telephone "Operator" and report a "Pollution Problem."

3.3 Environmental Compliance

- 3.3.1 On each workday, inspect each detector for proper operation.
- 3.3.2 Request equipment repairs whenever detectors or storage tanks are not operating as designed.
- 3.3.3 Respond to and resolve all reports of detector alarms.
- 3.3.4 Provide instructions and directions for decontamination as required by environmental law.

Prepared by:

J. C. Patterson, Section Manager Environmental Compliance

Department 1910

Approved by:

T. W. McMahon, Branch Manager Environmental Compliance

Department 1910

Approved by:

R. E. Bishop, Manager Plant Engineering

Department 190

Approved by: E. H. Ladage, Manager

E. N. Radage

Maintenance Department 190

Approved by: E. M. Myers, Director

Plant Engineering Department 190

MCDONNELL Douglas

STANDARD MAINTENANCE PROCEDURE

S.M.P. NO. <u>190-70-10</u>
TITLE "SPCC" - SPILL PREVENTION,
CONTROL AND COUNTERMEASURE PLAN:
CONTINGENCY PLAN; AND REPORTING SPILLS
OF OIL AND HAZARDOUS MATERIAL
EFFECTIVE 6 OCTOBER 1982
REVISED:

DATE: 6 OCT 1982 REVISION NO.: 0

SECTION I

CONTINGENCY PLAN (G)

HAZARDOUS MATERIAL STORAGE FACILITIES

MCDONNELL DOUGLAS CORP. - ST. LOUIS

(G-1) GENERAL INFORMATION

McDonnell Douglas Corp. - St. Louis (MDC - St. Louis) is an Aerospace Manufacturer with office and manufacturing buildings adjacent to Lambert St. Louis International Airport in St. Louis, Mo.

MDC-St. Louis stores various hazardous chemicals, supplies and raw materials from explosives to poisons to oil prior to use in manufacturing and ultimately for disposal.

In addition to storing these materials in a safe manner, MDC-St. Louis is required by 40 CFR Par. 264, Sub Part D, to prepare a contingency plan to address the actions that are to be taken if an accident should occur. This contingency plan will provide the decision-making criteria to the emergency coordinator.

DATE: 6 OCT 1982 REVISION NO.: 0 (G)

A. PURPOSE

The purpose of this plan is to prevent, reduce or eliminate pollution to the environment from environmental emergencies created by hazardous material stored in MDC-St. Louis Hazardous Waste Storage Facilities.

B. SCOPE

MDC-St. Louis is primarily an Aircraft and Spacecraft Manufacturer (i.e., airplanes, spacecraft, missiles). It consists of several companies formed into one corporation. This Contingency Plan covers the corrective action required in the event of a fire, explosion, or unintentional sudden or non-sudden release of hazardous material from on-site hazardous waste storage facilities located North of the Lambert-St. Louis International Airport.

C. REFERENCES

- Operations Manual Hazardous waste storage facilities located in Tract I.
- 2. S.M.P. 190-70-2 Removal of Small Quantities of Waste Chemical Solutions.
- 3. 40 CFR Par. 264 Sub Part D.

D. Emergency Information

- 1. On-Site Emergency Facilities and Services Emergency Phone Numbers
 - (314) 323-2611 MDC-St. Louis Fire Services
 - (314) 232-4942 First Aid and Medical
 - (314) 323-2821 Guard Headquarters

2. (G-2) Emergency Coordinators

* (314) 233-9824 - Section Manager, Environmental Compliance (Primary Coordinator)

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- * (314) 232-2370 Manager, Plant Design and Maintenance Engineering
- * (314) 234-7058 Director, Plant Engineering

R-1

- # (314) 232-2821 Plant Engineering Duty Officer
- # (314) 232-2821 Corporate Duty Officer

Note: See Attachment I for corresponding names and home phone numbers.

- (* = 8:00 a.m. to 4:30 p.m. normal work days)
- (# = All other times)

3. Emergency Equipment

MDC-St. Louis has its own Fire Services, which consists of at least eight firemen and one officer on duty at any given time. Fire Services equipment consists of: four Class A structural pumpers; two crash trucks with 2,000 gallons of water and 110 gallons of foam; two trucks with 1,000 lbs. of dry chemicals on each unit; one utility van; one car; two pickup trucks; and a trailer with 20 bags of oil-absorbent material. MDC-St. Louis has a "Pre-Fire Plan" (see Figure F-2 Section F) that defines the specifics of what is stored at this facility, where fire hydrants are located, what action is to be taken by firemen and guards in the event of a fire, and what backup community fire departments are to be called if necessary.

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ATTACHMENT I

EMERGENCY COORDINATORS

The following is a tabulation of titles and the personnel filling these positions at this time. Telephone numbers have been provided for use during "off duty" hours.

	<u>Title</u>	Name	Off Duty Telephone No.	
1.	Section Manager, Dept. 891C Environmental Compliance	J. C. Patterson	(314) 567-1336	R-1
				R-1
2.	Manager, Dept. 890 Plant Design and Maintenance Engineering	R. E. Bishop	(314) 389-0467	R-1
3.	Director, Dept. 890 Plant Engineering	E. M. Myers	(314) 432-2107	R-1

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4. Local Authority Arrangements

MDC-St. Louis has its own security guard services of more than two hundred twenty-five (225) people. Security guards are constantly on duty. They are classified as licensed private watchmen by the St. Louis County Police Department and have the authority to arrest as would commissioned officers of the St. Louis County Police Department. These security guards and the previously mentioned firemen constitute the local authorities in this situation. In respect to emergencies requiring hospitalization, MDC-St. Louis uses the services provided by Christian Northwest and Deaconess Hospitals for "non-burn" emergencies and St. John's Mercy Hospital for "burn" emergencies. The "911" emergency telephone system is in effect for this community and would be used in the event an emergency exceeds MDC's capabilities.

5. Emergency Facilities

The St. Louis MDC facilities are serviced by five first aid stations staffed with sixteen nurses. Nurse coverage is provided twenty-four hours per day, five days per week. The plant uses the services of Macon Medical Center, which provides physician coverage at the plant site on the day and evening shift five days per week. Macon Medical Center physicians are on the staff of both Christian Northwest and Deaconess Hospitals. The physicians are on call twenty-four hours per day, seven days per week. The hazardous materials used at the plant are covered by data sheets available in the Industrial Hygiene Office.

In the event that it is necessary to transport an injured employee to the hospital a Macon Medical Center physician is contacted for instructions and the hospital is notified of the type of injury or exposure. The physicians and nurses are aware of the hazardous materials in their areas and can assist the hospitals in determining exposures.

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R-2

6. Environmental Compliance

Environmental Compliance, a section of Plant Engineering, implements environmental procedures at the plant. In the event of a pollution emergency, a representative of this group monitors the emergency site and provides assistance and direction for controlling the emergency and cleaning up the area. Environmental Compliance is also responsible for notifying the National Response Center (800-424-8802) if the situation requires such action.

7. Duties of Emergency Coordinator

In the event of a pollution emergency, the first person discovering the emergency shall notify the Fire Services at inplant telephone number 22611 and the Guard Services Headquarters at inplant telephone number 22821. They will in turn notify an emergency coordinator, starting at the top of the list and working down. The first person contacted shall be the emergency coordinator for that particular situation and shall act as an "on-site coordinator" and shall remain there until the situation is over. Evacuating and cordoning the area is the responsibility of Security Services. The MDC-St. Louis Fire Chief shall decide if assistance is required from a local fire department.

E. (G-3) Implementation of the Contingency Plan

The decision to implement the contingency plan depends upon whether or not an imminent or actual incident could threaten human health or the environment. The purpose of this section is to provide guidance to the emergency coordinator in making this decision by providing decision-making criteria.

TABLE G-1

EMERGENCY CONTACTS

Injury	MDC Guard Headquarters	(314)	232-2821
Fire/Explosion	MDC Fire Department	(314)	232-2611
	MDC Guard Headquarters	(314)	232-2821
Hazardous Material Spill or Release	MDC Fire Department	(314)	232-2611
	MDC Guard Headquarters	(314)	323-2821
If Spill Reaches Navigable Water	National Response Center		800/424-8801
	Mo. Dept. of Natural Resources	(314)	751-2436
		(314)	634-2436
	Metropolitan St. Louis Sewer District	(314)	768-6260

- 2. The contingency plan will be implemented in the following situations:
 - 2.1 Fire and/or Explosion
 - a. A fire causes the release of toxic fumes.
 - b. The fire spreads and could possibly ignite materials at other locations onsite or could cause heat-induced explosions.
 - c. The fire could possibly spread to offsite areas.
 - d. Use of water or water and chemical fire suppressant could result in contaminated runoff.
 - e. An imminent danger exists that an explosion could occur, causing a safety hazard because of flying fragments or shock waves.
 - f. An imminent danger exists that an explosion could ignite other hazardious waste at the facility.
 - g. An imminent danger exists that an explosion could result in release of toxic material.
 - h. An explosion has occurred.

2.2 Spills or Materials Release

- The spill could result in release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.
- b. The spill could cause the release of toxic liquids or fumes.
- c. The spill can be contained onsite, but the potential exists for ground water contamination.
- d. The spill cannot be contained onsite, resulting in offsite soil contamination and/or ground or surface water pollution.

F. (G-4) Emergency Response Procedures

- 1. (G-4a) Notification [40 CFR 264.56(a)] [10 SCR 25-7.011(5)(G)]. In the event of an emergency situation the Fire Services and Security Services will be notified first; subsequently, the emergency coordinator will be notified; then the appropriate federal, state, or local agencies, will also be notified. See Table G-1.
- 2. (G-4b) Identification of Hazardous Wastes [40 CFR 264.56(b)] [10 CSR 25-7.050(3)(B)].

The emergency coordinator will immediately identify the character, exact source, amount and area extent of the release. The initial identification method will be to utilize visual analysis of the material and location of the release. The containers are labeled and are in distinct separate locations. If for some reason the released material cannot be identified, samples will be taken for analysis.

- 3. (G-4c) Assessment [40 CFR 264.56(c) and (d)] [10 CSR 25-7.011(5)(G)3].
 The emergency coordinator will assess possible hazards, both direct and indirect, to human health, property and equipment, or the environment.
- 4. (G-4d) Control Procedures [40 CFR 264.51 and 56] [10 CSR 25-7.011(5)(C) and 7.011(5)(G)].

Potential accidents fall under three general classifications: (1) fire and/or explosions, (2) spills or material release, (3) floods. Natural disasters such as earthquakes or tornadoes are assumed to fall into one of these three classifications.

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G. Fire and/or Explosion

- 1. The storage tanks and containers can be easily accessed by fire-fighting and other emergency vehicles and equipment. MDC-St. Louis has a "Pre-Fire Plan" that defines the specifics of what is stored in this facility, where fire hydrants are located, what action is to be taken by firemen and guards in the event of a fire, and what backup community fire departments are to be called if necessary.
- 2. Company fire services is available for all general plant emergencies. MDC-St. Louis has its own Fire Services which consists of at least eight firemen and one officer on duty at any given time. If a fire should break out, they will concentrate on preventing the fire from spreading to nearby areas.
- 3. The following actions will be taken in the areas affected by the fire or explosion:
 - 3.1 Call Fire Services.
 - 3.2 Hazardous work in all adjacent areas will be shut down immediately.
 - 3.3 All feed lines and additional equipment will be shut down, as necessary and practical.
 - 3.4 The emergency coordinator will be contacted by the fire department.
 - 3.5 The area will be cleared of all personnel not actively involved in fighting the fire.
 - 3.6 All injured persons will be removed, and medical treatment will be administered by the in-plant first aid staff.

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- 4. Possible sources of ignition have been eliminated in areas where flammable materials are stored. Vehicular traffic in the area will be controlled until the spill is contained and safety is restored. If spilled materials are flammable, the Fire Services will respond with foam equipment and hoses. Flushing with large quantities of water or foaming of the spill will be performed only if advised by a Fire Services officer.
- 5. If a highly flammable material is released (e.g. propane or natural gas), a decision, based on volume, immediate danger, and impending explosion, will be made concerning notifying or evacuating personnel in the surrounding area. Use of motor vehicles within this area will be restricted or eliminated to avoid ignition of the vapor, which can cause a flashback to the source and an initial explosion of fire of wide dimensions.
- 6. An "all clear" signal will be given when the fire has been extinguished and the safety of personnel is no longer endangered. The Fire Services officer will determine when the emergency has passed and consult with the emergency coordinator before the "all clear" signal is given.

H. Spills or Material Release

1. In the event of a major emergency involving a chemical spill, the following general procedures will be used for rapid and safe response and control of the situation. If the spill is a flammable material, notify the Fire Services. Report all other spills to Environmental Compliance, Phone 23319, between 8 a.m. and 4:30 p.m. Monday through Friday. On second and third shifts, Monday through Friday, and all shifts Saturday, Sunday, and holidays, phone the MDC-St. Louis Telephone Operator and report the nature of the emergency.

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- 2. When contacted, the designated Emergency Coordinator will obtain information pertaining to the following:
 - 2.1 The material spilled or released
 - 2.2 Location of the release or spillage of hazardous material
 - 2.3 An estimate of quantity released and the rate at which it is being released
 - 2.4 The direction in which the spill or vapor or smoke release is heading
 - 2.5 Any injuries involved
 - 2.6 Fire and/or explosion or possibility of these events
- 3. This information will help the Emergency Coordinator to assess the magnitude and potential seriousness of the spill or release. The Emergency Coordinator will contact and deploy the necessary inplant personnel. If the accident is beyond plant capabilities, the Emergency Coordinator will contact the appropriate agencies.
- 4. The initial response to any emergency will be to protect human health and safety, property and equipment and then the environment. Identification, containment, treatment and disposal assessment will be the secondary response.
- 5. In the event of a leak or spill in the tank area, all feed lines to the storage tanks will be closed. The dike surrounding the above ground tank storage area has a drain to the industrial sewer which connects with the industrial waste water pretreatment plant. Immediately after the spill is detected, the waste water pretreatment plant supervisor will be notified of the amount and material spilled so he can take appropriate corrective action.

- 6. If for some reason a chemical spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large and involves a tank or pipline rupture, an initial isolation of at least 100 ft in all directions will be used. Small spills or leaks from a tank or pipe will require evacuation of at least 50 ft in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. The Security Services will rope off the area.
- 7. If the spill results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire) and it is released (due to high vapor pressures under ambient conditions), further evacuation will be enforced.
- 8. The Security Services will be responsible for contacting local law enforcement agencies if the situation becomes serious enough to require evacuation of surrounding homes, businesses or industries. Because winds in the area tend to vary, the quickest and most accurate assessment of meteorological conditions is accomplished by calling the MDC-St. Louis Flight Test Radio Tower at 22917 from 7 a.m. to 5:30 p.m., Monday thru Friday. All other times, call the Airport Tower at 425-7228.
- 9. If the control and cleanup of a spill, release, or fire is within the capabilities of company personnel and local response teams, the National Response Center will not be notified unless one of the following occurs:

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- A spill discharges to Coldwater Creek and the quantity of hazardous material spilled is equal to or greater than the reportable quantity specified under 40 CFR Part 117.3.
- One thousand gallons or more of oil is spilled in a single event. If a lesser quantity has been spilled but has entered a storm sewer leading to Coldwater Creek, it is advisable to contact local and state authorities for assistance if it is not possible to intercept the spill at the outfall or prevent the oil slick from moving downstream.
- The spill involves other hazardous materials not listed but used at the plant if they pose an actual or potential hazard to life or property.
- 10. As called for in regulations developed under the Comprehensive Environmental Liability and Compensation Act of 1980 (Superfund), our practice is to report a spill of a pound or more of any hazardous material for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or TSCA. We also follow the same practice for any substances not listed in the Acts noted above but which can be classified as a hazardous waste under RCRA.
- 11. If the Emergency Coordinator determines that the company is unable to handle the emergency, then local, state, and federal authorities will be notified of the situation. Evacuation of all potentially affected plant areas will be initiated as soon as possible.

- 12. The following guidelines will be used in case of an accidental episode involving hazardous materials. There are general guidelines, and circumstances may dictate some alterations to these procedures.
- 13. Most hazardous material spills and leaks are easily contained within the dikes and sumps provided for that purpose. Small spills occurring in a diked area are flushed with plenty of water to the sump provided in that area. If necessary, a portable sump pump is used to pump the diluted waste material into 55-gallon drums. Procedures for handling large spills are as follows:
- 14. For all large spills or serious leaks the following guidelines will be followed as closely as possible:
 - 14.1 If a leak developes or a spill occurs from a hazardous material storage tank, pipeline pump, etc., the person discovering the discharges will leave the immediate area and contact Fire Services, if it is a flammable material. If not, notify the Emergency Coordinator.

 The Emergency Coordinator will obtain the following information:
 - Person(s) injured and seriousness of injury.
 - b. Location of the spill or leak, material involved, and source (tank, pipeline, etc.)
 - c. The appropriate amount spilled, an estimate of the liquid and/or gas discharge rate, and the direction the liquid flow or gasseous cloud is moving.
 - d. Whether or not a fire is involved.
 - 14.2 Next, the Emergency Coordinator will:
 - a. Initiate evacuation of the hazard area. For small spills or leaks, isolate at least 50 ft in all directions. For large spills, initially isolate at least 100 ft in all directions and keep all persons upwind of spill.

- b. Obtain medical attention for any injured persons. It may be helpful to instruct the caller in initial first aid procedures.
- c. IF A RISING SOUND COMES FROM A VENTING DEVICE OR THE TANK BEGINS TO DISCOLOR, EVACUATE THE AREA IMMEDIATELY.
- d. Request area maintenance supervision to take the appropriate action.
- e. Contact the proper authorities if the spill or release is large. Contact local authorities first so that, if necessary, downstream water users and/or persons downwind of the vapor can be notified and, if necessary, evacuated.

14.3 Cleanup personnel will:

- a. Make sure all unnecessary persons are removed from the hazard area.
- b. Put on protective clothing and equipment.
- c. If flammable material is involved, remove all ignition sources, and use spark and explosion proof equipment and clothing in containment and cleanup.
- d. If possible try to stop the leak.
- e. Remove all surrounding materials that could be especially reactive with the hazardous material. Determine the major components in the material at the time of the spill.
- f. Use absorbent pads, booms, earth, sandbags, sand, and other inert materials to contain, divert and clean up a spill if it has not been contained by a dike or sump. Most spills contained within the dike or sump can be pumped into an appropriate storage tank or drum.

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- If the spill reaches a storm sewer, try to dam the outfall q. to Coldwater Creek by using sand, earth, sandbags, etc. If this is done, pump this material out into a temporary holding tank or drums as soon as possible. If a spill enters the creek or has entered a storm drain, use absorbent booms and sweeps around the outfall to contain and absorb water-insoluble organics.
- Place all containment and cleanup materials in drums or h. portable tanks for proper disposal.

I. Floods

2.

- 1. These facilities are not within the 100-year flood plain, so no flood plan is included.
- (G-4E) Prevention of Recurrence or Spread of Fires, Explosions or Releases [40 CFR 264.56(e)] [10 CSR 25.7.011(5)(G)5]. Actions to prevent the recurrence or spread of fires, explosions or releases include stopping processes and operations, collecting and containing released waste, and recovering or isolating containers. The onsite training manual addresses the specific actions to be taken in an emergency. In addition, if the facility stops operations in response to an emergency, the emergency coordinator will monitor valves, pipes, and other equipment for leaks,
- 3. (G-4F) Storage and Treatment of Released Material [CFR 264.56 (g)] [10 CSR 25-7.011(5)(G)7].

pressure build up, gas generation or ruptures.

Immediately after an emergency, the emergency coordinator will make arrangements for treatment, storage, or disposal of recovered waste, contaminated soil, surface water, or any other contaminated material.

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- 4. (G-4G) Imcompatible Wastes [40 CFR 264.56 (h)] [10 CSR 25-7.011(5)(G)8.A]. The emergency coordinator will ensure that materials which may be compatible with the released material are treated, stored or disposed of until cleanup procedures are completed.
- 5. (G-4H) Post-Emergency Equipment Maintenance [40 CFR 264.56(h)(2)].

 After an emergency event, all emergency equipment listed in Section G5 will be cleaned so that it is fit for use or it will be replaced.
- 6. (G-4I) Container Spills and Leakage [40 CFR 264.171] [10 CSR 25-7.050(3)(B)].
 Refer to Par. H for a discussion of emergency reponse procedures for container spills and leakeage.
- 7. (G-4J) Tank Spills and Leakage [40 CFR 264.194(c)] [10 CSR 25-7.050(4)(G)]. Refer to Par. H for a discussion of tank spills and leakage emergency response procedures.
- 8. (G-4K) Waste Piles
 This facility has no waste piles and are not covered in this contingency plan.

J. (G-5) Emergency Equipment

1. MDC-St. Louis has its own Fire Services which consists of at least eight firemen and one officer on duty at any given time. Fire Services equipment consists of: four Class A structural pumpers; two crash trucks with 2,000 gallons of water and 110 gallons of foam, two trucks with 1,000 lbs. of dry chemicals on each unit; one utility van; one car; two pick-up trucks; and a trailer with 20 bags of oil absorbant material. MDC-St. Louis has a "Pre-Fire Plan", see Figure F-2 Section F, that defines the specifics of what is stored at this facility, where fire hydrants are located, what action is to be taken by firemen and guards in the event of a fire, and what backup community fire departments are to be called if necessary.

TABLE G-2

EQUIPMENT AND MATERIAL FOR SPILL CONTAINMENT AND CLEANUP

- Drum, fifty-five (55) gallon, with polyethylene liners, new, or used and triple rinsed. (DOT 37M)
- 2. Drum, fifty-five (55) gallon, mild steel, new, or used and triple rinsed. (DOT 17E and 17H)
- 3. Carboy, five (5) gallon, polythylene, new, with cardboard carton. (DOT 2U carboy and DOT 21P carton)
- 4. Container, one (1) gallon, polyethylene
- 5. Pump, transfer, portable acid resistant
- 6. Wrench, Bung
- 7. Caddy-Drum for fifty-five (55) gallon drum
- 8. Truck Ford lift
- 9. Attachment Drum lift, for fork lift truck
- 10. Trailer Flatbed, eight (8) wheel, with either sideboards or safety chains
- 11. Tank Mobile, unlined stainless steel, five hundred (500) gallon capacity
- 12. Tank Mobile, chlorobutyl lined, stainless steel, one thousand (1,000) gallon capacity
- 13. Soda Ash Commercial grade. (Material Code No. 183-32180 100# bags)
- 14. Oil Absorbent compound. (Material Code No. 185-31516 50# bags)
- 15. Kit Emergency chemical transfer kit
- 16. Trailer Fire Department, with bags of oil absorbent compound
- 17. SAFETY EQUIPMENT
 - 17.1 Safety clothing, P.V.C., consisting of jacket and pants
 - 17.2 Chemical goggles or face shield

TABLE G-2 (Cont.d.)

- 17.3 Boots rubber, over-the-shoe type
- 17.4 Gloves rubber, plastic, or acid resistant
- 17.5 Respirator Protects against acid gases alone or in combination with organic vapors. See Kep No. 1.4 of Air Purifying Respirators Personal Protective Devices manual. If mists are encountered, add pre-filter and clamp (See Key No. 1.5)
- 17.6 Apron acid resistant

K. (G-6) Coordination Agreements

MDC-St. Louis has its own security guard service of more than two hundred twenty-five (225) people. Security guards are constantly on duty. They are classified as licensed private watchmen by the St. Louis County Police Department and have the authority to arrest as would commissioned officers of the St. Louis County Police Department. These security guards and the above mentioned firemen constitute the local authorities in this situation. In respect to emergencies requiring hospitalization, MDC uses the services provided by Christian Northwest Hospital for "non-burn" emergencies and St. John's Mercy Hospital for "burn" emergencies. The "911" emergency telephone system is in effect for this community and would be used in the event an emergency exceeds MDC's capabilities.

L. (G-7) Evacuation Plan

1. All emergencies require prompt and deliberate action. In the event of any major emergency, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible; however, in specific emergency situations, the Emergency Coordinator may deviate from the procedures to provide a more effective plan for bringing the situation under control. The Emergency Coordinator will contact the security department when an emergency situation requires plant evacuation. See Emergency Plan No. 4, Building Emergency Actions and Procedures. (Attachment II)

- 2. A fire alarm system is installed with alarm boxes located at critical areas throughout the plant in addition to some 20,000 telephones.
 The Fire Safety Instruction Poster which is posted throughout the plant informs employees how to report a fire. (See Figure G-1)
- M. (G-8) Required Reports [40 CFR 264.56(d) and 264.56(i)]

 As required by §264.56(J), an emergency event (e.g., fire, explosion, etc.) that requires implementing the contingency plan will be reported in writing within 15 days to the EPA Regional Administrator.

N. Amendments to the Contingency Plan

The contingency plan will be reviewed and immediately amended, if necessary, whenever:

- 1. The facility permit is revised.
- 2. The plan fails in an emergency.
- 3. The facility changes in its design; construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous material or hazardous material constituents, or changes in the response necessary in any emergency.
- 4. The list of emergency coordinators change.
- 5. The list of emergency equipment changes.
- 6. The three year SPCC Plan is reviewed.

MCDONNELL AIRCRAFT COMPANY





NO.: 4

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DATE: 23 March 1982

SUPERSEDES: 1 Aug. 1974

DATE: 6 OCT 1982 REVISION NO.: 0

(G)

ATTACHMENT II

SUMMARY

SUBJECT: BUILDING EMERGENCY ACTIONS AND PROCEDURES

This plan outlines the procedures to be followed in the event that an incident requires a building, work area, or complex of buildings to be evacuated for the safety of personnel or causes personnel to seek shelter in protected areas of buildings. Also addressed are other situations requiring reaction by emergency personnel.

B. APPLICABLE TO: MDC Components, St. Louis

C. GENERAL

- 1. Situations which could seriously disrupt normal operations and require implementation of evacuation procedures include fires, explosions, and collapse of structures. Conversely, tornadoes may require persons to seek shelter in protected areas of buildings.
- 2. The emergency controls to be implemented in response to a situation include:
 - a. Directing the Fire Services, Guard Services, Safety and Medical, Plant Engineering, or other appropriate department to respond to a given situation.
 - b. Informing employes of personal and property protection actions required in emergency situations.
 - c. Taking actions to minimize harmful effects upon personnel and property.
 - d. Providing for corrective measures and restoration actions to return to normal operating conditions.
- 3. This plan is general in nature and requires selected individuals to develop specific work area evacuation procedures for their area of responsibility. These procedures will cover evacuation from the building as well as to a sheltered or protected area in the building. (See Para E., TASKS)

D. ACTION PLAN

- Reporting Emergency Situations
 - a. Fire, Explosion, Building Evacuation
 - The person discovering a fire or explosion will turnin an alarm at the nearest fire alarm box or telephone
 Fire Services at 22611. When telephonically reporting
 an incident, give an accurate location and do not
 hang up until you are sure your message has been
 received.
 - 2) If <u>practical</u> and <u>safe</u>, attempt to control the fire with an extinguisher.
 - instructions. Then inform supervisor of action taken and post a guide in a safe area to direct firemen to the exact location of the fire.
 - 4) All others should follow prearranged evacuation plans when ordered to evacuate. (See paragraph E2)
 - b. Accident or Injury
 - 1) Call First Aid at 24942.
 - Suspected Heart Attack. If situation warrants, commence cardio pulmonary resuscitation (CPR) and call First Aid or Guard Services at 22821. MDC CPR-qualified personnel other than Guards or Firemen can be identified by a white lettered "CPR" on a red background addition to their employee identification badge.
 - In all instances, post a guide to assist responding emergency personnel in getting to the exact location of the incident.
 - c. Situations Requiring Guard Service Reaction.
 - 1) Situations may arise involving bomb threats, interpersonal disputes, suspected theft or misappropriation of property, suspected trespass, etc.
 - 2) Call Guard Services at 22821 or notify the nearest building Security Guard Station.

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Note details of the incident and be prepared to convey to the responding Guard as to the who, what, when, where, why, and how pertaining to the situation.

E. TASKS

- 1. Authority to Order Evacuation or Take Cover.
 - In case of fire or explosion, authority to order evacuation from the area is delegated to the lowest level, that is to the person discovering the fire and making the decision that it is unsafe to remain in that location.
 - b. Tornado Warnings are issued when a tornado has been spotted on the ground in a locality. Under these conditions it is considered prudent to seek shelter. Component Presidents or their designees are authorized to order persons under their control to take shelter.
- 2. Personnel Division, MCAIR
 - a. Coordinate with components, divisions and departments to designate Emergency Action Coordinators for each MDC-owned or leased building in the St. Louis Area.
 - b. Provide a list of coordinators so designated to the Security Department, MCAIR, Attention: Emergency Planning Officer.
- Emergency Action Coordinators
 - a. Appoint persons at the appropriate level in each functional area to prepare evacuation procedures for employes under their supervision.
 - b. These procedures will include, as a minimum, the following items:
 - 1) Evacuation from the building and/or movement to protected area in the structure.
 - 2) Routes to emergency exits and protected areas.
 - Designation of Evacuation Monitors to guide employee movements.
 - 4) Emergency shutdown procedures and protection of classified and proprietary material.

- 5) Type announcements made to activate the evacuation.
- Specific procedures to insure that handicapped individuals, especially those in wheelchairs, are assisted in getting down stairways and those with hearing defects are notified of the particular warning signal.
- 7) Specific instructions to brief new employes about emergency procedures.
- Review building plans to insure that personnel movements are synchronized to provide a rapid, even flow to evacuation areas.
- d. Report completion of building procedures to the Security Department Emergency Plans Office, Station 38110.
- e. Schedule periodic rehersals of plans at least to the Evacuation Monitor level and ensure that all personnel are familiar with their evacuation routes by use of diagrams or walk-throughs.

4. Security Department, MCAIR

- Maintain a list of Emergency Action Coordinators and keep them apprised of changes and modifications to applicable emergency plans.
- Provide advice and assistance, when requested, to Emergency Action Coordinators concerning the security aspects of building emergency plans. This includes Fire and Guard Services assistance.
- Medical and Safety Department, MCAIR. Provide advice and assistance, when requested, to Emergency Action Coordinators concerning the medical and safety aspects of building emergency plans.

6. Plant Engineering

- a. Provide advice and assistance, when requested, to Emergency Action Coordinators concerning damage control and shut down procedures.
- b. Operate the plant-wide public address system through Department 198 to make emergency announcements as required.
- Develop an alternate communications plan for buildings not currently covered in the plant-wide public address system. Provide a copy of this plan to the Security Department.

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- d. Provide Emergency Action Coordinators with instructions on how to get localized emergency announcements made over the public address system.
- 7. General emergency instructions to be given to all employes. See Appendix 1.

F. WARNINGS

- 1. Warnings, evacuation, and take cover instructions may be given by the following methods:
 - a. Verbal instructions issued at the scene of the emergency.
 - b. Use of "Loud Hailers" by Fire or Guard Services personnel upon arrival at the scene.
 - c. Use of the Plant Public Address System activated at:
 - 1) Guard Services Dept. 69.
 - 2) MDC Telecommunications Center Dept. 26.
 - 3) MDC PA Systems and Communications Center Dept. 198.
 - d. Community Tornado Alarm (Siren) Systems.
- 2. "All Clear" instructions will be given utilizing one of the methods specified above.

G. REFERENCES

- 1. MDC Administrative Directive No. 1.26, Subject: Major Accidents and Incidents.
- 2. MDC Administrative Directive No. 14.6, Subject: Loss Preventive Program.
- 3. MCAIR Control Procedure No. 1.301, Subject: Emergency Control Operations.
- 4. Emergency Plan No. 2, Subject: Severe Weather Plan.

H. APPENDIX

1. General Emergency Evacuation Instructions.

Appendix 1-EP4 Date: 23 March 1982

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SUBJECT: GENERAL EMERGENCY EVACUATION INSTRUCTIONS

General emergency evacuation instructions to be given to all employees will include:

- 1. Use designated evacuation routes for building and/or area.
- 2. Follow emergency instructions as may be issued by supervision and monitors.
- 3. Move rapidly but do not run. Proceed down stairways in an orderly manner when notified to evacuate plant premises. Do not crowd the person ahead. DO NOT use elevator in event of a fire.
- 4. DO NOT scream, laugh or talk or cause unnecessary noise.
- 5. Use the telephones only to report the emergency Not for personal business during the emergency period.
- 6. If time and situations permit, take action to protect the documents you might be working on. Secure documents in your desk or a file cabinet. Turn off machines and equipment per instructions.
- 7. DO NOT remain in restrooms or locker rooms.
- 8. DO NOT return for clothing or personal items.
- 9. DO NOT attempt to return into the building or area if instructed to evacuate until the all clear instructions have been given.
- 10. DO NOT attempt to exit building through the MARDIX Control stations. Exit through emergency exit doors.

MCDONNELL DOUGLAS CORPORATION

FIRE SAFETY INSTRUCTIONS

TO ALL PERSONNEL

ALL personnel must realize the importance of Fire Prevention, Fire Protection and the need for immediate extinguishment of a fire.

To ensure a better Fire Protection and Fire Prevention Program, cooperation of all personnel and familiarity with the following is required:

Fire Department Telephone Numbers
Fire Alarm Boxes
Fire Exits, Fire Extinguishers and Hose Panels

- 1. In the event of fire, sound the alarm immediately so that other personnel may assist in extinguishing the fire, relaying the alarm to the FIRE DEPARTMENT, evacuating the area or salvaging equipment.
- 2. Foreman of the department involved by fire shall be in complete charge of evacuating personnel and combating the fire until the Fire Department arrives.
- 3. All personnel not assisting in extinguishing the fire or in salvage operations shall leave the affected area. Walk rapidly; do not run. Do not block aisles in the immediate area.
- 4. NO ACTION WHATSOEVER shall be taken by untrained individuals to combat fire in transformer vaults.
- 5. Water extinguishers shall not be used on electrical fires.
- 6. If alone, do not fight the fire unless you are sure you can extinguish it with equipment available. CALL THE FIRE DEPARTMENT IMMEDIATELY. Remember, the first thing you do in the first few minutes in any fire will decide the outcome.
- 7. TO REPORT A FIRE BY TELEPHONE, CALL 22611
- 8. When reporting a fire by telephone, speak slowly and clearly and give the following information:

Building Number Location of Fire in Building Your Name

- 9. When reporting a fire by fire alarm box, stand by the box to direct firemen to scene of fire.
- 10. In the event of fire causing sprinkler activation, no employe shall make any attempt to shut off the system or impede the operation thereof. CALL THE FIRE DEPARTMENT IMMEDIATELY BY TELEPHONE.

22611 OR PULL THE NEAREST ALARM BOX.

- 11. In the event of accidental breakage of sprinkler lines or heads in buildings located at St. Louis-Lambert Field, call Fire Department immediately; for outlying buildings call GUARD on duty. If location of sprinkler control valves are known, you may turn them off only in the event of accidental breakage.
- 12. All sprinkler control valves that are closed, regardless of reason, shall be reported to the McDonnell Douglas Fire Department immediately. (Telephone 22285)
- 13. No welding or cutting operation shall be permitted on McDonnell Douglas property unless authorized by the McDonnell Douglas Fire Department.
- 14. Smoking shall be permitted only in accordance with appropriate regulations and in designated areas.
- 15. Any fire equipment used, accidentally broken or damaged, shall be reported to the McDonnell Douglas Fire Department immediately so arrangements can be made to replace same. (Telephone 22285)

FIGURE G-1

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SECTION II

INSOLUBLE (FLOATING) MATERIAL

A. PURPOSE

McDonnell Douglas Corporation - St. Louis is an aerospace manufacturer with office and manufacturing buildings adjacent to the Lambert-St. Louis International Airport in St. Louis, Missouri. Because a number of storm water outfalls lead from MDC property to Coldwater Creek, a real possibility exists for an accidental discharge of oil from MDC facilities to navigable water. Therefore, the purpose of this SPCC plan is to prevent, reduce, or eliminate pollution to the environment from MDC facilities through a program of preparedness and prevention. This is accomplished through engineered spill prevention and detection, providing material, equipment, and manpower to contain and recover an accidental spill or discharge and an employee awareness program through training. This SPCC is required by the Code of Federal Regulations, Title 40, Sub Part D, Part 112, and 40 CFR 264, Sub Part D.

B. SCOPE

- 1. Plant Engineering Maintenance and the Environmental Compliance Section have primary responsibility for containment and recovery of a discharge.
- 2. The divisional companies included in this procedure are as follows:
 - 2.1 McDonnell Aircraft Company (MCAIR)
 Lambert-St. Louis International Airport
 Banshee Road
 St. Louis, Missouri

- 2. (Continued)
 - 2.2 McDonnell Douglas Astronautics Company (MDAC)

'McDonnell Blvd.

St. Louis, Missouri

2.3 McDonnell Douglas Automation Company

Headquarters (MCAUTO)

McDonnell Blvd.

St. Louis, Missouri

2.4 McDonnell Douglas Research Laboratories (MDRL)

Airport Road

St. Louis, Missouri

2.5 McDonnell Douglas Corporation

Headquarters (MDC)

McDonnell Blvd.

St. Louis, Missouri

3. The following is a list of all oil storage tanks for this complex

3.1 FUEL OIL

Location	Tank Capacity <u>Gallons</u>	Number of Tanks	Above or Below Ground
Bldg. 001 005 005 005 005 032 033 034 037 038 Ramp (Gas Isla 045 (Emer. Ge		1 2 1 1 2 1 2 1 1	Below Below Above Below Below Below Below Below Above Below Above
062	1,000	7	Below

3. 3.1 (Continued)

Location Bldg. 66 90 101 102 102 102 102 106 107 121	5,000 22,000 500 200 1,000 20,000 5,000 4,000 100,000 50,000	Number of Tanks 2 1 1 1 2 1 1 1 1	Above or Below Ground Below Below Above Below Below Below Below Below Above Above		
3.2 GASOLINE					
Bldg. 3 3 (Unleaded) 2 22 22 24 41 (Ramp) 62 62 66 72 91 102 121 220 250 HQ (Unleaded) 310	5,000 8,000 1,000 7,500 300 10,000 8,000 (each) 500 500 500 500 500 1,000 250 500 5,000 1,000 (each)	1 1 1 1 1 2 1 1 1 1 1 1	Below Below Below Above Below Above		
3.3 JP-4 (JET FUEL)					
Bldg. 28 (Trailer) 28 Hush House 28 Ramp (Water Check Sta 41 62 F-18 Engine Test Cell Fuel Pit No. 3 Fuel Pit No. 4 Ramp Station 1 and 2	trailers 15,000 (each) 5,000	1 1 2 4) 4 2 1 1 1	Above Below Below Above Below Below Below Below Below Below Below Below	R R R	

_				
3.	3.4 SOLVENTS Location		umber Tanks	Above or Below Ground
	Bldg. 041	4,000 (Contents	2	Below
	051	variable) 6,000 (58% Xylene) (21% Perchloroethy	l lene)	Below
	101	(21% Toluene) 1,000 (MEK)	1	Below
	3.5 <u>CUTTING OILS</u>			
	Bldg. 027 027 027 027	3,000 (Each) 2,000 (Each) 1,000 6,000 (Waste)	2 5 1	Basement Basement Basement Basement
	3.6 WASTE OIL			
	Bldg. 106	1,000	1	Below
	3.7 DIESEL FUEL			
	Bldg. 022 022 HQ 103 122 312 026 3.8 JP-5 (JET FUEL)	300 10,000 650 1,000 250 6,000 250	1 1 1 1 2	Above Below Below Above Below Above
	Bldg. Ramp (Water Check Sta.)	4,000	l (Trailer)	Ab o ve

NOTE: The information in this tabulation is based on the listing dated 30 January 1980, issued by Dept. 064. Corrections have been made to this listing based on actual knowledge.

C. EQUIPMENT AND MATERIAL

- The following is a detailed list of oil spill containment and collection equipment that is stored at MDC - ST. Louis,
 - 1.1 LOCATION Parking Lot #3 (East of Bldg. 27).
 IDENTIFICATION Wooden Box labeled "Emergency Oil Absorbing Boom". This box is next to the fence along McDonnell Blvd.

C. 1. 1.1 (Continued)

It is 10 ft. long and 3 ft. high. It contains four (4) oil absorbing booms (Type 270-3M Brand, 8-inch diameter by 10 ft. length each) and 50 ft. of rope for installing and removing booms.

1.2 LOCATION - Bldg. 009

IDENTIFICATION - Metal Box labeled "Emergency Oil Absorbents".

This box is located inside Bldg. 009 at the southeast corner, on the ground level. This box contains -

- 1 Bale (100 sheets) Type 156 3M Brand Oil Absorbent
- 1 Bale (10 pillows) Type 240 3M Brand Oil Absorbent
- 1 Bale (4 booms) Type 270 3M Brand Oil Absorbent

50 ft. rope

- l Janitorial mop wringer
- 1 Bucket

1.3 LOCATION - Bldg. 014

IDENTIFICATION - Trailer labeled "Oil Spill Response Trailer". This trailer requires an automobile or truck equipped with a trailer hitch to move to the work site. This trailer contains the following equipment.

- 1 Bale (100 Sheets) Type 156 3M Brand Oil Absorbent
- 1 Bale (10 pillows) Type 240 3M Brand Oil Absorbent
- 2 Bales (4 booms) Type 270 3M Brand Oil Absorbent
- 1 Oil Skimmer Gasoline Powered Acme Model SK-39T
- 2 Lengths discharge hose 100 ft. each
- 2 Mop Wringers
- 2 Barrels, Open Top 55 gal.
- 2 Mop buckets
- 2 Pair hip boots size 9 and size 11

D. GOVERNMENTAL REGULATIONS

- 1. The U.S. Environmental Protection Agency's Oil Pollution Prevention Program for non-transportation related on-shore and off-shore facilities reference Code of Federal Regulations (CFR), Title 40, Subcharacter D, Part 112 - Oil Pollution Prevention, is explained as follows.
 - 1.1 This part establishes procedures, methods and equipment and other requirements for equipment to prevent the discharge of oil from nontransportation-related on-shore and off-shore facilities into or upon the navigable waters of the United States or adjoining shorelines.

1.2 Section 112.2 Definitions

"0il"

Means oil of any kind or in any form, including, but not limited to petroleum, jet fuel, fuel oil, sludge, oil refuse and oil mixed with wastes other than dredged spoil.

"Discharge"

This part defines discharge which includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping.

"Onshore"

This part means any facility (plant or equipment) located in, on or under any land within the United States other than submerged lands, which is not a transportation-related facility.

D. 1. 1.2 (Continued)

"Person"

This part includes an individual, firm, corporation, association and a partnership.

1.3 Section 112.3 SPCC Control Plan

"Preparation"

Owners or operators of on-shore facilities that could reasonably be expected to discharge oil in harmful quantities (causing a film or sheen upon or discoloration on the surface of the water) into navigable waters shall prepare a Spill Prevention Control and Countermeasure Plan (SPCC) in accordance with Section 112.7. This plan must be reviewed and certified by a Registered Professional Engineer.

1.4 Section 112.4 SPCC Plan Amendments

Whenever a facility subject to Section 112.3 has discharged more than 1,000 gallons of oil into or upon navigable waters in a single spill event, or "discharged oil in harmful quantities", such facility shall submit to the Regional Administrator, within 60 days from the time of incident, a complete report, giving full description of such incident and what corrective actions and countermeasures will be taken to minimize the possibility of recurrence.

1.5 Section 112.5 SPCC Plan Amendments

Owners or operators of facilities shall amend the SPCC plan whenever there is a change in facility design (equipment or plant, construction or operation which will affect the facility's potential to discharge oil into or upon navigable waters. Each SPCC plan shall be reviewed for each facility at least once

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D. 1. 1.5 (Continued)

every three (3) years from the date such facility becomes subject to these sections.

1.6 Section 112.6 Civil Penalties

Owners or operators of facilities subject to Section 112.3 (a), (b), (c), who violate the requirements of these sections by failing or refusing to comply with any of the provisions shall be liable for a civil penalty of not more than \$5,000 for each day that such violation continues. No penalty shall be assessed until the owner or operator has been given notice and an opportunity for hearing.

E. GENERAL

- McDonnell Douglas Corporation St. Louis Environmental Pollution
 Control Program
 - 1.1 The Environmental Compliance section is assigned the responsibility of conducting "all liaison between MDC-St. Louis and the various regulatory bodies, including reporting spills to the National Response Center".
 - 1.2 Spills are reported to Environmental Compliance by calling 232-3319 between 8:00 a.m. and 4:30 p.m. Monday through Friday. On second and third shifts, weekends, and holidays, call the MDC telephone operator. The message will be relayed via telephone or Pocket Pager System.

F. MCAIR OIL SPILL PREVENTION PLAN

- 1. Fuel Oil Storage All above-ground tanks in excess of 300 gallons, except the 9,000-gallon CoaLiquid fuel tank at Bldg. 5, are provided with concrete wall or diked enclosures to contain any losses. All underground tanks in excess of 500 gallons (except for emergency generator tanks at Bldg. 106 1,500 gal., Bldg. 107 4,000 gal.) are checked monthly. Note: CoaLiquid is a mixture of 50% pulverized coal, 40% No. 6 fuel oil, and 10% water. Due to its high viscosity, spill liability is low!
- Gasoline Storage All above-ground tanks do not have any spill containment enclosures. The maximum size tank in this service is 500 gallons. All underground tanks (except for emergency generator tank at Bldg. 2 -1,000 gallons) are checked monthly.
- 3. <u>Jet Fuel (JP-4)</u> All stationary tanks (non-trailers) are located underground.
- 4. Solvents Bulk solvent storage is maintained in underground tanks.
- 5. <u>Cutting Oils</u> A total of nine tanks having a total capacity of 23,000 gallons are located in Bldg. 27 "Anodize" basement. The sewer in this basement area is connected to the Bldg. 14 Industrial Waste Water Treatment Plant; therefore, no losses can escape to open streams.

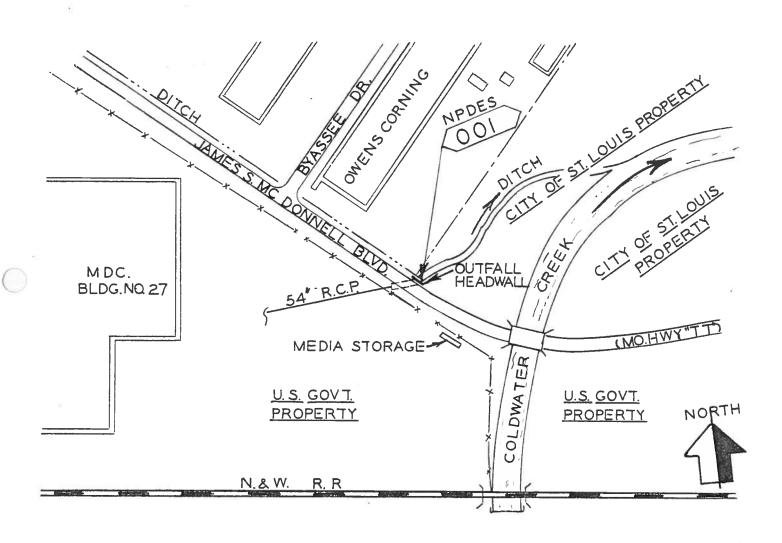
G. OPERATIONAL RESPONSIBILITIES

Oil Spill Countermeasure Plan

1. <u>Tract I - North</u> - Dept. 892A Maintenance Superintendent Responsibility <u>Identification</u> - Oil spilled into any storm sewer drainage system in Tract I - North will flow from the McDonnell property of NPDES Outfall 001. This outfall is located on the north side of McDonnell Blvd., east of the entrance to Owens-Corning Company. The McDonnell effluent comes from underneath McDonnell Blvd.

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G. 1. (Continued)



Oil absorbing media is stored in a wooden box located in the MDC parking lot souteast of NPDES Outfall 001. This wooden box is 10 ft. long and 3 ft. high and is identified as "EMERGENCY - OIL ABSORBING BOOM".

G. 1. (Continued)

Action - The Maintenance supervision responsible for Tract I - North will, immediately upon receiving knowledge of any oil entering the storm sewers in Tract I - North, take the following sequence of steps.

- 1.1 Send maintenance personnel to the "Emergency Oil Absorbing
 Boom" storage box located in parking lot 3.
- 1.2 Move oil absorbing media from the storage box to NPDES Outfall 001.
- 1.3 Install oil absorbing media across the entire width of the flowing stream, allowing the media to float on the water surface.
- 1.4 If this action does not contain the oil or if this action was too late to prevent the passage of any oil then, obtain the "Oil Spill Response Trailer" located at Bldg. 14. (This trailer is equipped with the necessary equipment to contain and remove spilled oils.) This trailer must then be towed over the roads to a location on Coldwater Creek where the oil has not yet reached.
 - 14.a If it has been LESS than two hours since oil was discharged at NPDES Outfall 001, take the 0il Spill Response Trailer to the railroad trestle over Coldwater Creek northeast of the intersection of Eva Ave. and Frost Ave. Install the oil absorbing media and begin oil collection using floating skimmer as required.

G. 1. 1.4

1.4b If it has been MORE than two hours since oil was discharged at NPDES Outfall 001, take the 0il Spill Response Trailer to the intersection of Coldwater Creek and Highway I-270 south service road (9000 Pershall Road). Install the oil-absorbing media and begin oil collecting using floating skimmer as required.

NOTE: Under normal flow conditions, oil discharged from NPDES Outfall 001 will require six (6) or more hours to reach Coldwater Creek and Pershall Road.

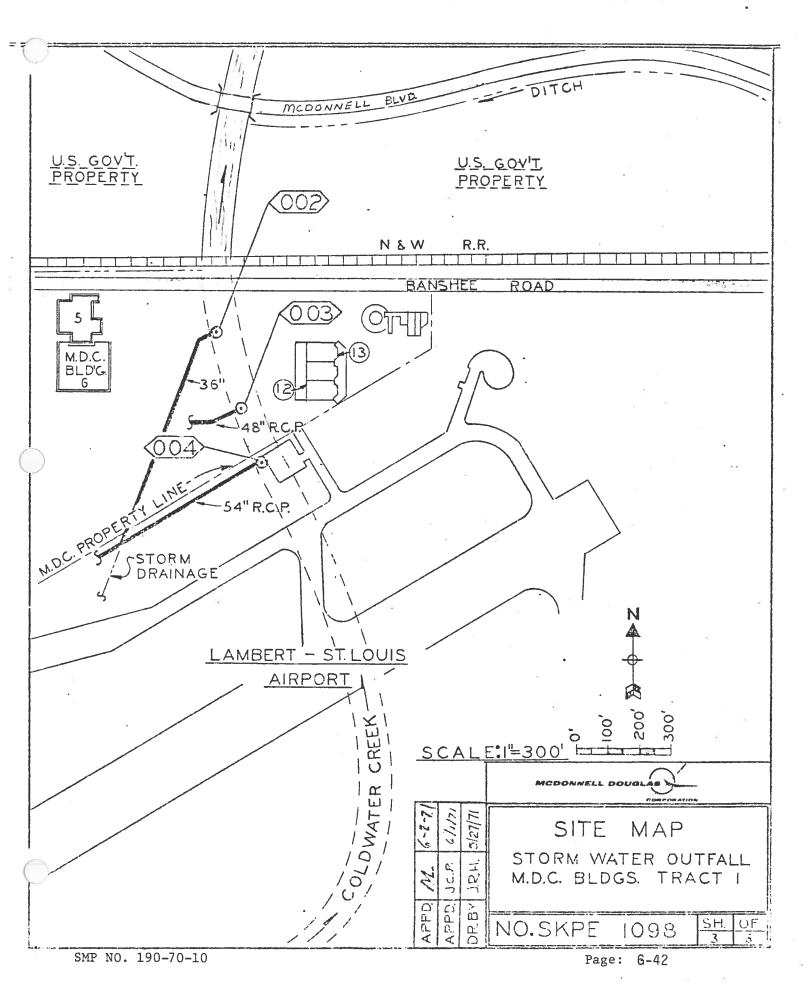
2. Tract I - South - Dept. 892B Maintenance Superintendent Responsibility Identification - Oil spilled into storm sewer drainage systems in Tract I - South will flow from the McDonnell property of NPDES Outfalls 002, 003, or 004. Outfalls 002 and 004 enter Coldwater Creek underground. Access to Outfall 003 is gained by entering the electrical substation (Bldg. 8) and then going into the Bldg. 9 pump house. Outfall 003 is the outlet of the stream flowing through the bottom of Bldg. 9. Oilabsorbing media is stored in the cabinet located in the southeast corner of Bldg. 9 on the floor level that you enter (metal grate floor) and also in a box identified as "Emergency Oil Absorbing Boom" located in Parking Lot 3.

Action - The Maintenance supervision responsible for Tract I - South will, immediately upon receiving knowledge of any oil entering the storm sewers in Tract I - South, take the following sequence of steps.

2.1 Send Maintenance personnel to the "Emergency Oil Absorbing Media" storage box located in Bldg. 9 and install one (1) 10 ft. boom across at this location.

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G. 2. (Continued)

- 2.2 Remove the remaining oil absorbing booms from the storage box and install in Coldwater Creek immediately north of Banshee Road. The boom must float on the water surface and reach the entire width of the flowing water.
- 2.3 If Step 2 does not contain the oil, then go to the storage box in parking lot 3 labeled "Emergency Oil Absorbing Boom" and take the boom and install them in Coldwater Creek immediately south of McDonnell Blvd.
- 2.4 If Step 3 does not contain the oil or was too late, then go to Bldg. 14, obtain the Oil Spill Response Trailer and tow the trailer to a location on Coldwater Creek where the oil has not yet reached.
 - 2.4a If it has been LESS than two (2) hours since oil was discharged at Coldwater Creek and Banshee Road, take the Oil Spill Response Trailer to the railroad trestle over Coldwater Creek northwest of the intersection of Eva Ave. and Frost Ave. (follow the railroad tracks). Install the oil absorbing media and begin oil collection using the floating skimmer as required.
 - 2.4b If it has been MORE than two (2) hours since oil was discharged at Coldwater Creek and Banshee Road, take the Oil Spill Response Trailer to the intersection of Coldwater Creek and the Highway I-270 South Service Road (9000 Pershall Road). Install the oil absorbing media and begin oil collection using the floating skimmer as required. NOTE: Under

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G. 2. 2.4 2.4b (Continued)

normal flow conditions, oil discharged into Coldwater Creek at Banshee Road will require six (6) or more hours to reach Coldwater Creek and Pershall Road.

3. Tract II - Depts. 893A and 893B Maintenance Superintendent Responsibility

Identification - Oil spilled into any storm sewer drainage systems in

Tract II will flow from McDonnell property at NPDES Outfalls 006, 007,

010, or 011. All of these outfalls ultimately discharge into a tributary

of Coldwater Creek which flows north, parallel to Eva Avenue. The oilabsorbing media to be used for this area will be found in the Oil Spill

Response Trailer located at Bldg. 14.

Action - The Maintenance supervision responsible for Tract II will, immediately upon receiving knowledge of any oil entering the storm sewer in Tract II, take the following steps.

- 3.1 Send Maintenance personnel to Bldg. 14, obtain the Oil Spill Response
 Trailer and tow the trailer to Tract II.
- 3.2 Determine which NPDES outfall the oil discharge is occurring and take the Oil Spill Response Trailer there.
- 3.3 Install oil-absorbing media to prevent oil from escaping McDonnell property.
- 3.4 If oil has already been discharged past these NPDES outfalls, then proceed with the Oil Spill Response Trailer to the intersection of Frost Avenue and Eva Avenue. Immediately east of Eva Avenue is a "ditch" that is common to all Tract II NPDES outfalls (plus non-McDonnell flows). If the oil has not yet reached this location, install the oil-absorbing booms and begin oil collection using the floating skimmer as required.

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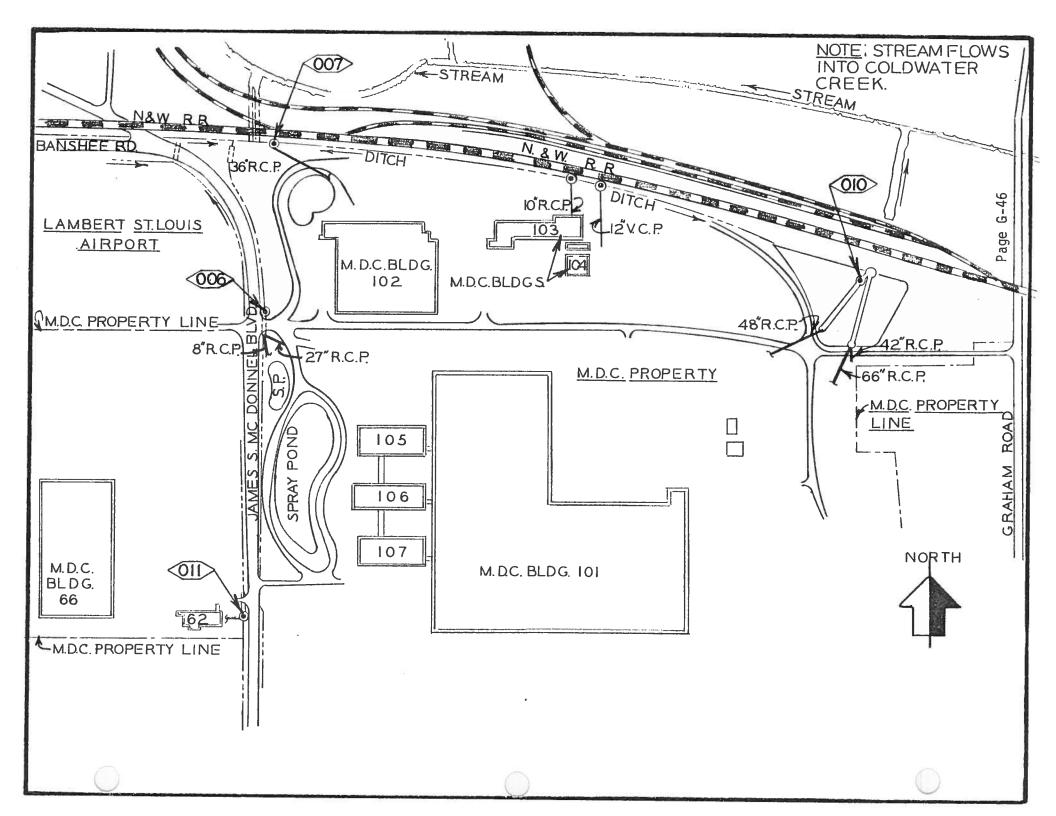
G. 3. (Continued)

3.5 If oil has already passed this location, then proceed with the Oil Spill Response Trailer to the intersection of Coldwater Creek and Highway I-270 South Service Road (9000 Pershall Road). Install the oil-absorbing media and begin collecting oil, using the floating skimmer as required. NOTE: Under normal flow conditions, oil discharged from Tract II will require seven (7) or more hours to reach Coldwater Creek and Pershall Road.

4. <u>Oil Leak Countermeasure Plan</u>

- 4.1 All Tracts Maintenance Superintendents are responsible for oil leaks in their respective tracts. Immediately upon receiving knowledge of oil leakage, the following steps will be taken.
 - 4.1a Begin action to stop leak. If the leak cannot be stopped immediately by closing valves, installing plugs, etc., the tank must be immediately emptied.
 - 4.1b Begin action to contain the leakage. This can be accomplished by using containers to catch the fluid or by diking and containment.
 - 4.1c If oil has penetrated the ground, one of the following actions must be taken to prevent groundwater contamination.
 - I If minor, remove contaminated earth and handle as hazardous waste.
 - II If major, the oil must be retrieved from the groundwater table. This will be accomplished by installing a well that will allow groundwater and oil pumping.
- 4.2 The leaking tank will be removed from service until repaired.

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SECTION III

MDC-ST. LOUIS PLAN

"REPORTING SPILLS OF OIL AND HAZARDOUS MATERIALS"

SCOPE:

The following plan is established for the primary purpose of monitoring, investigating, and reporting spills of oil and hazardous materials, as they affect water pollution potential of storm sewer systems. Understandably, other items of concern would also be involved, such as safety and health conditions, fire protection, insurance, and maintenance. These areas are covered by separate established procedures and plans. Consequently, reference is made to these activities only for coordination purposes.

A. <u>Emergency Coordinator</u> - The MDC-St. Louis Emergency Coordinator is the Section Manager, Environmental Compliance, Dept. 891C, McDonnell Aircraft Company [telephone (314) 233-9824]. The coordinator has the overall responsibility for ensuring the performance of the activities specified in the "SCOPE." The alternate MDC-St. Louis Emergency Coordinator is the Waste Removal Coordinator, Environmental Compliance, Dept. 891C, McDonnell Aircraft Company [telephone (314) 232-3319]. See Attachment III for a current list of names and home phone numbers of personnel filling these positions.

B. <u>Surveillance and Monitoring Activities:</u>

Functional Operations - Environmental Compliance is directly responsible
for functional operations. Environmental engineers and inspectors
within this group periodically inspect operations and monitor potential
upset conditions through a regular routine of sample collection and analysis.

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- 2. Emergency Reporting System In order to maintain continuous, around-the-clock surveillance and monitoring of MDC-St. Louis facilities, an "Emergency Reporting System" has been adopted and fully implemented. Refer to Administrative Bulletin No. 82-117 dated 08 September 1982 (Attachment I). This reporting procedure is used in the manner set forth in the "Internal Pollution Upset Reporting Procedure" dated 08 August 1972, revised 02 July 1976 (Attachment II).
- 3. Harmful Quantities of Hazardous Substances Effective 28

 September 1979, the U.S. Environmental Protection Agency has issued a list of chemicals that, when discharged in the specified quantities (see below), constitutes a harmful quantity. If any of these chemicals are discharged in excess of their listed harmful quantity in any 24-hour period, this must be reported immediately per the "Emergency Reporting System" (see Paragraph B2 above).

NOTE: The following is the list of reportable quantities of hazardous substances as published in Title 40, Code of Federal Regulations, Par. 117.3, as of 1 July 1982.

117.3 DETERMINATION OF REPORTABLE QUANTITIES.

The quantity listed with each substance in Table 117.3 is determined to be the reportable quantity for that substance.

TABLE 117.3 REPORTABLE QUANTITIES OF HAZARDOUS SUBSTANCES

Note: The first number under the column headed "RQ" is the reportable quantity in pounds. The number in parantheses is the metric equivalent in kilograms. For convenience, the table contains

a column headed "Category" which lists the code letters, "X", "A", "B", "C" and "D" associated with reportable quantities of 1, 10, 100, 1000 and 5000 pounds respectively.

		RQ In
<u>Material</u>	Category	(Kilograms)
Acetaldehyde Acetic acid Acetic anhydride Acetone cyanohydrin Acetyl bromide Acetyl chloride Acrolein Acrylonitrile Adipic acid Aldrin Allyl alcohol Allyl chloride Aluminum sulfate Ammonium benzoate Ammonium bicarbonate Ammonium bichromate Ammonium bisulfite Ammonium carbamate Ammonium carbamate Ammonium chloride Ammonium chloride Ammonium chloride Ammonium fluoborate Ammonium floride Ammonium floride Ammonium hydroxide Ammonium oxalate	C C C A D D X B D X B C D B D D D C D D D D C D D D C D	Pounds (Kilograms) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 5,000 (2,270) 5,000 (2,270) 1 (0.454) 100 (45.4) 5,000 (2,270) 1 (0.454) 100 (45.4) 5,000 (2,270) 1,000 (45.4) 5,000 (2,270)
Ammonium oxalate Ammonium silicofluoride	D C	1,000 (454) 5,000 (2,270) 1,000 (454)
Ammonium oxalate	D	5,000 (2,270)
Ammonium thiosulfate Amyl acetate	D C	5,000 (2,270) 1,000 (454)

<u>Material</u>	Category	RQ In Pounds (Kilograms)
Antimony pentachloride Antimony potassium tartrate Antimony tribromide Antimony trichloride Antimony trifluoride Antimony trioxide Antimony trioxide Arsenic disulfide Arsenic pentoxide Arsenic trichloride Arsenic trisulfide Barium cyanide Benzene Benzoic acid Benzonitrile Benzoyl chloride Beryllium chloride Beryllium fluoride Beryllium fluoride Beryllium nitrate Butyl acetate n-Butyl phthalate Butylamine Butyric acid Cadmium acetate Cadmium bromide Cadmium chloride Calcium arsenate Calcium arsenite Calcium carbide Calcium chromate Calcium cyanide Calcium	C C C C C C D D D D D D A C D C C B D D D D B C D B B B C C D C A C	1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454)
dodecylbenzenesulfonate Calcium hypochlorite Captan Carbaryl Carbofuran Carbon disulfide Carbon tetrachloride Chlordane Chlorine Chloroform	B A B A D D X A B	100 (45.4) 10 (4.54) 100 (45.4) 10 (4.54) 5,000 (2,270) 5,000 (2,270) 1 (0.454) 10 (4.54) 100 (45.4) 5,000 (2,270)

<u>Material</u>	Category	RQ In Pounds (Kilograms)
Chlorpyrifos	X	1 (0.454)
Chlorosulfonic acid	C C	1,000 (454)
Chromic acetate	C	1,000 (454)
Chromic acid	C	1,000 (454)
Chromic sulfate	· C	1,000 (454)
Chromous chloride Cobaltous bromide	C	1,000 (454)
Cobaltous formate	C C C C	1,000 (454)
Cobaltous sulfamate	C	1,000 (454) 1,000 (454)
Coumaphos	Ā	10 (4.54)
Cresol	Ċ	1,000 (454)
Crotonal dehyde	В	100 (45.4)
Cupric acetate	В	100 (45.4)
Cupric acetoarsenite	В	100 (45.4)
Cupric chloride	Α	10 (4.54)
Cupric nitrate	В	100 (45.4)
Cupric oxalate	В	100 (45.4)
Cupric sulfate	A	10 (4.54)
Cupric sulfate ammoniated	В	100 (45.4)
Cupric tartrate	В	100 (45.4)
Cyanogen chloride Cyclohexane	A C	10 (4.54)
2,4-D Acid	В	1,000 (454) 100 (45.4)
2,4-D Esters	В	100 (45.4)
DDT	X	1 (0.454)
Diazinon	X	1 (0.454)
Dicamba	C	1,000 (454)
Dichlobenil	С	1,000 (454)
Dichlone	Χ	1 (0.454)
Dichlorobenzene	В	100 (45.4)
Dichloropropane	D	5,000 (2,270)
Dichloropropene	D	5,000 (2,270)
Dichloropropene-	D	5,000 (2,270)
Dichloropropane Mixture	D	F 000 (0 070)
2,2-Dichloropropionic acid Dichlorvos	D	5,000 (2,270)
Dieldrin	: A X	10 (4.54) 1 (0.454)
Diethylamine	Ĉ	1,000 (454)
Dimethylamine		1,000 (454)
Dinitrobenzene	C C C	1,000 (454)
Dinitrophenol	C	1,000 (454)
Dinitrotoluene	С	1,000 (454)
Diquat	С	1,000 (454)

<u>Material</u>	Category	RQ In Pounds (Kilograms)
Disulfoton Diuron Dodecylbenzenesulfonic acid Endosulfan Endrin Epichlorohydrin Ethion Ethylbenzene Ethylenediamine Ethylene dibromide Ethylene dichloride EDTA Ferric ammonium citrate Ferric ahloride Ferric fluoride Ferric fluoride Ferric sulfate Ferric sulfate Ferrous ammonium sulfate Ferrous chloride Ferrous chloride Ferrous chloride Ferrous chloride Ferrous chloride Ferrous sulfate Ferrous chloride Ferrous sulfate Formaldehyde Formic acid Furfural Guthion Heptachlor Hexachlorocyclopentadiene Hydrochloric acid Hydrogen cyanide Hydrogen sulfide Isoprene Isopropanolamine	X B C X X C A C C C D D C C C C B C C C B C C D D C X X X D D A B C C	1 (0.454) 100 (45.4) 1,000 (454) 1 (0.454) 1 (0.454) 1,000 (454) 1 (0.454) 1 (0.454) 1 (0.454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454)
dodecylbenzenesulfonate Kelthane Kepone Lead acetate Lead arsenate Lead Chloride Lead fluoborate Lead fluoride	D X D D D C	5,000 (2,270) 1 (0.454) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 5,000 (2,270) 1,000 (454)

<u>Material</u>	Category	RQ In Pounds (Kilograms)
Lead iodide Lead nitrate Lead stearate Lead sulfate Lead sulfide Lead thiocyanate Lindane Lithium chromate Malathion Maleic acid Maleic anhydride Mercaptodimethur Mercuric cyanide Mercuric nitrate Mercuric sulfate Mercuric thiocyanate Mercuric thiocyanate Mercurous nitrate Methoxychlor Methyl mercaptan Methyl mercaptan Methyl methacrylate Methyl parathion Mevinphos Mexacarbate Monoethylamine Naled Naphthalene Naphthenic acid Nickel ammonium sulfate Nickel chloride Nickel hydroxide Nickel nitrate Nickel sulfate Nickel sulfate Nitric acid Nitrobenzene Nitrogen dioxide Nitrotoluene Paraformaldehyde Parathion Pentachlorophenol Phenol Phosgene	Category D D D D D D X C A D D B X A A A A A X B D B X C C C C C C C C C C C X A C D	
Phosphoric acid Phosphorous Phosphorous oxychloride	D X D	5,000 (2,270) 1 (0.454) 5,000 (2,270)
Phosphorous pentasulfide	B B	5,000 (2,270) 100 (45.4)

Material	Category	RQ In Pounds (Kilograms)
Phosphorus trichloride Polychlorinated biphenyls Potassium arsenate Potassium bichromate Potassium chromate Potassium cyanide Potassium permanganate Potassium permanganate Propargite Propionic acid Propionic anhydride Propylene oxide Pyrethrins Quinoline Resorcinal Selenium oxide Silver nitrate Sodium Sodium arsenate Sodium bichromate Sodium bisulfite Sodium cyanide Sodium Sodium cyanide Sodium dodecylbenzenesulfonate	DACCCACBADDDCCCCXCCCCDDCAC	5,000 (2,270) 10 (4.54) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 100 (454) 100 (45.4) 100 (45.4) 100 (2,270) 5,000 (2,270) 5,000 (2,270) 1,000 (454)
Sodium fluoride Sodium hydrosulfide Sodium hydroxide Sodium hypochlorite Sodium methylate Sodium nitrite Sodium phosphate, dibasic Sodium phosphate, tribasic Sodium selenite Strontium chromate Strychnine Styrene Sulfuric acid	D D C B C B D D C C A C C	5,000 (2,270) 5,000 (2,270) 1,000 (454) 100 (45.4) 1,000 (45.4) 5,000 (2,270) 5,000 (2,270) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454)

Material	Category	RQ In Pounds (Kilograms)
Sulfur monochloride 2,4,5-T acid 2,4,5-T amines 2,4,5-T esters 2,4,5-T salts 2,4,5-TP acid 2,4,5-TP acid esters TDE Tetraethyl lead Tetraethyl pyrophosphate Thallium sulfate Toluene Toxaphene Trichlorfon Trichloroethylene Trichlorophenol Triethanolamine	C B B B B B C C X C C A C	1,000 (454) 100 (45.4) 100 (45.4) 100 (45.4) 100 (45.4) 100 (45.4) 100 (45.4) 1 (0.454) 100 (45.4) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454)
dodecylbenzenesulfonate Triethylamine Trimethylamine Uranyl acetate Uranyl nitrate Vanadium pentoxide Vanadyl sulfate Vinyl acetate Vinylidene chloride Xylene Xylenol Zinc acetate Zinc ammonium chloride Zinc borate Zinc bromide Zinc carbonate Zinc chloride Zinc fluoride Zinc formate Zinc formate Zinc hydrosulfite Zinc phenolsulfate		5,000 (2,270) 1,000 (454) 5,000 (2,270) 5,000 (2,270) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 5,000 (2,270) 1,000 (454) 5,000 (2,270) 1,000 (454) 5,000 (2,270) 1,000 (454) 5,000 (2,270) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 1,000 (454) 5,000 (2,270) 5,000 (2,270)

Material	<u>Category</u>	RQ In Pounds (Kilograms)
Zinc phosphide	С	1,000 (454)
Zinc silicofluoride	D	5,000 (2,270)
Zinc sulfate	С	1,000 (454)
Zirconium nitrate	D	5,000 (2,270)
Zirconium potassium	fluoride D	5,000 (2,270)
Zirconium sulfate	D	5,000 (2,270)
Zirconium tetrachlor	ide D	5,000 (2,270)

- C. <u>External Notification Procedures</u> The following agencies and/or persons will be notified by the MDC-St. Louis Emergency Coordinator or his authorized representative immediately in the event of an upset condition involving spills of oil and hazardous materials.
 - 1. Duty Officer
 National Response Center
 U.S. Coast Guard
 Washington, D.C.
 Telephone: Toll Free (800) 424-8802
 - 2. Metropolitan St. Louis Sewer District (MSD) Industrial Waste Division Manager, Industrial Pollution Control Telephone: (314) 231-1950 (8:00 a.m. to 4:30 p.m., Monday-Friday) (314) 768-6260 (all other times)

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D. <u>Internal Notification Procedures</u> - The following MDC-St. Louis personnel will be notified as required for coordination purposes and/or possible corrective action, depending upon the nature of the upset condition.

		Telephone Number (Normal Work Hours)		
1.	Crisis Management Coordinator Executive Officer Command Section U.S. Navy	Sta. 22731		
2.	NAVPRO, CNO Sub-Area Coordinator Representative U.S. Navy	Sta. 22875		
3.	Chief Property Management Branch U.S. Navy	Sta. 22459		
4.	Safety Engineer U.S. Navy	Sta. 23444		
5.	Manager, Dept. 064 Occupational Safety and Medical Services	Sta. 30436		R-1
6.	Director, Dept. 890 Plant Engineering	Sta. 47058	250	R-1
7.	Manager, Dept. 890 Plant Design and Maintenance Engineering	Sta. 22379		R-1
				R-1

NOTE: See Attachment III for a current list of names and home phone numbers of the personnel filling these positions.

- E. <u>Pollution Incident Notification Format</u> Whenever written reports are prepared, the following format will be followed:
 - Item #1 Name of installation.
 - Item #2 Date/Time of incident.
 - Item #3 Severity of incident. Specify degree (serious or minor) of
 potential or actual threat to human life; to property (private,
 state, or federal); to plant or animal life, etc.
 - Item #4 Location of incident and the nature of the terrain at the location to include surface and subsurface drainage characteristics and relationships to water bodies (estimate extent of area affected, such as miles of stream or acres of lake).
 - Item #5 Cause of incident.
 - Item #6 Type and estimated amount (barrels/gallons/pounds) of pollutant.
 - Item #7 Damage impact on the surroudings, including fish and wildlife.
 Include type of fish or wildlife affected and an estimate of number killed.
 - Item #8 Corrective action to eliminate pollution source.
 - Item #9 Corrective action taken to remove pollutant.
 - Item #10 Assistance required.
 - Item #11 Estimated completion date of remedial actions.
 - Item #12 Anticipated or actual reaction by the news media and public to the incident. Specify potential for liability.

NOTE: In respect to Bldg. 27 (Air Force Plant #84), written notification will be forwarded through the U.S. Navy NAVPRO CNO Sub-Area, Coordinator Representative for distribution to AFSC/PPDO, AFSC/PPS, USAF/SGPAAP, PREV, and RXDI.

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MAC 3378 (REV 9 DEC 69)

ATTACHMENT I

Date: 06 Oct 82 Revision No.: 0

MCDONNELL AIRCRAFT COMPANY



ADMINISTRATIVE | BULLETIN

MCAIR Plant Lists C, D, E, F, G, and H; MDC, MDAC-E, MCAUTO (St. Louis only) Plant Lists B, C, and D

SUBJECT: Emergency Reporting System for "Upset" Conditions Involving Environmental Pollution

- 1. Local, State, and Federal Environmental Control Ordinances (laws) require that immediate notification be given in the event of accidental spills, unavoidable upsets, equipment breakdown, or any other malfunctions that may result in environmental pollution. Please be advised that the following reporting system has been made available for use by MDC personnel directly or indirectly involved in such activities. Reporting by responsible personnel is mandatory.
- 2. Reporting System: To report an upset condition, telephone according to the following schedule:
 - 2.1 First Shift (8:00 a.m. 4:30 p.m.), Monday through Friday

Telephone Sta. 23319

2.2 Second and Third Shifts, Monday through Friday, and All Shifts Saturday, Sunday, and Holidays

Telephone "Operator"

- 3. <u>Instructions:</u> When reporting an upset condition, it is important to identify yourself by giving your name, title, department number, and location. Upset conditions must be reported immediately.
- J. C. Patterson, Section Manager, Environmental Pollution Control, has been designated the Emergency Coordinator, and is responsible for investigating and resolving the incident and for notifying the proper pollution control agency.

E. M. Myers

Manager, Plant Engineering McDonnell Aircraft Company R. D. Singleton

Director, Plant Engineering McDonnell Aircraft Company

Post: Bulletin Boards, Manufacturing Area

ATTACHMENT II

INTERNAL POLLUTION UPSET REPORTING PROCEDURE

(INSTRUCTIONS TO MDC-ST. LOUIS TELEPHONE OPERATORS)

- 1. In order to satisfy the requirements of the U.S. Department of Defense, MCAIR Management and the United States Environmental Protection Agency, we have instituted the following reporting system.
- 2. McDonnell telephone operators will continue to receive "Pollution Upset" reports between 4:30 p.m. and 8:00 a.m., Monday through Friday and during all shifts on Saturdays, Sundays, and holidays. Whenever a telephone operator receives a "Pollution Upset" report, the operator shall contact Environmental Compliance via the pocket pager. The pocket pager will be rotated among the Environmental Compliance staff. Whoever has the pocket pager should respond. The MDC telephone operator shall then wait 30 minutes. If no one responds to the pocket pager, begin calling the following personnel in sequence, starting at the top of the list, until you are able to reach one of them. If you are unable to reach anyone, wait 30 minutes and start the sequence over again, starting with the pocket pager. If no one has been contacted by the end of the shift, instruct the next shift to continue calling until contact is made.

•1	^	0
U.	. .	Patterson

Home Phone - 567-1336

P.E. Duty Officer

(Weekends and Holidays only)

R. E. Bishop

Home Phone - 389-0467

E. M. Myers

Home Phone - 432-2107

3. The telephone operators shall record the "Pollution Upset" report in writing and orally relay them to the individual they are successful in contacting.

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ATTACHMENT III

The following is a tabulation of titles and the personnel filling these positions at this time. Telephone numbers have been provided for use during "off duty" hours.

	<u>Title</u>	<u>Name</u>	Off-Duty Telephone No.	
, 1.	MDC-St. Louis Emergency Coordinator Dept. 891C	J. C. Patterson	(314) 567-1336	R-1
2.	Alternate MDC-St. Louis Emergency Coordinator Dept. 891C	R. J. Linzmaier	(314) 447-3080	R-1
3.	Crisis Management Coordinator Executive Officer Command Section	*W. H. Goesling (AA)	*(314) 232-0232 Ask to speak to "Air Force Duty Officer"	
4.	Safety Engineer	*J. Q. Harbison (SE)	II	
5.	NAVPRO CNO Sub-Area Coordinator Representative	*D. T. Smith (IN)	u	
6.	Chief Property Management Branch	*J. H. White (INX)	u	
7.	Manager, Dept. 064 Occupational Safety and Medical Services	R. L. Kuhn	None at this time	R-1
8.	Director, Dept. 890 Plant Engineering	E. M. Myers	(314) 432-2107	R-1
9.	Manager, Dept. 890 Plant Design and Maintenance Engineering	R. E. Bishop	(314) 389-0467	R-1
		g n " n n, 8,		R-1

Prepared by:

R. J. Linzmaier

Senior Engineer, Plant Environmental Pollution

Control

Approved by:

R. D. Singleton

Director

Plant Engineering

Approved by

J. C. Patterson

Section Manager Environmental Pollution

Control

Approved by:

I. H. Rutherford

Director Security

Approved by:

T. W. McMahon

Branch Manager

Plant Environment and

Fire Protection Engineering

Approved by: 3

B. L. Thompson

Manager

Occupational Safety and Medical Services

Approved by:

E. M. Myers

Manager, Plant Design and Maintenance Engineering P.E. License No. E8041



Date: 6 Oct 1982 Revision No.: 0 (H)

SECTION H

PERSONNEL TRAINING

The information contained in this section outlines the Personnel Training Program for McDonnell Douglas Corp. - St. Louis, (MDC-St. Louis) Hazardous Waste Storage Facilities in accordance with the requirements of 40 CFR 122.25(a)(12), 264.12, and 10 CSR 25-7.011.

H-1 OUTLINE OF TRAINING PROGRAM (40 CFR 122.25(a)(12), 10 CSR 25-7.011(3)(F) and (7))

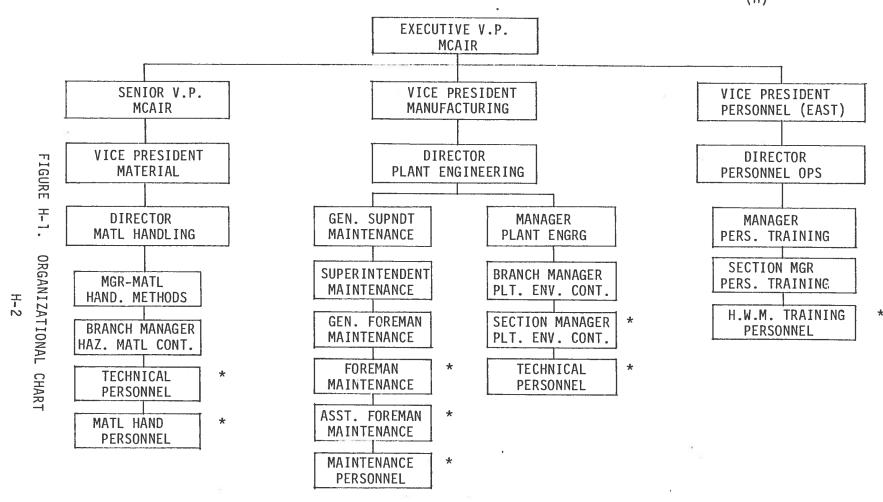
H-la JOB TITLES AND DUTIES

Figure H-l shows the titular organization of personnel at MDC-St. Louis. Those title blocks bearing an asterisk (*) indicate the functional levels directly involved with hazardous waste handling activities; all other functions shown exercise management responsibilities involving compliance with RCRA regulations, but are not involved with the actual training, supervision of, or handling of hazardous wastes. The duties, responsibilities, and qualifications for each position or job title are on file in the company Personnel Division and may be reviewed by EPA officials and Missouri DNR upon request.

H-1b TRAINING PROGRAM CONTENT

A Master Training Manual has been developed for use in training MDC-St. Louis personnel in the Hazardous Waste Program. Provisions are made for revising the text as necessary to ensure compliance with the RCRA regulations. An outline of the Training Manual content is shown in Figure H-2. In addition to this program, key company personnel have and will continue to attend technical seminars and training programs on hazardous waste, RCRA regulations, and Missouri DNR regulations.

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NOTES: (1) The large number of personnel involved precludes entering specific names on this organizational chart. The names of responsible HWM personnel may be found elsewhere in this document. (This chart maintained by EPC).

(2) * Indicates organizational levels directly involved with HWM activities.

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INTRODUCTION SECTION 1

- 1.1 The Resource Conservation and Recovery Act
- 1.2 Definition of Hazardous Wastes and Safety Precautions

FACILITY AND PROGRESS DESCRIPTION SECTION 2

- 2.1 Description of Wastes to be Managed
- Description of Storage Facilities
- 2.3 Normal/Routine Operations
- 2.4 Waste Analysis
- 2.5 Inspections
- 2.6 Security
- Record-Keeping and Reporting Requirements

SECTION 3 EMERGENCY PROCEDURES AND CONTINGENCY PLANS

- 3.1 **Emergency Coordinators**
- 3.2 Emergency Procedures
- 3.3 MDC-St. Louis Contingency Plan
- 3.4 Spill Prevention Control and Countermeasures Plan
- 3.5 MDC-St. Louis (Emergency) Control Procedures
- 3.6 MDC-St. Louis Standard Maintenance Procedures
- 3.7 Fire Services Emergency Procedures (Summary)

APPENDIX A - LIST OF EMERGENCY CONTACTS WITH ADDRESSES AND PHONE NUMBERS

- A-1 MDC-St. Louis Listings
- A-2 State Listings
- A-3 Federal Listings

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A brief description of each section of the Training Manual follows: Section $1 - \frac{1}{2}$

1.1 The Resource Conservation and Recovery Act

This section discusses the authority for regulating hazardous wastes, in particular Subtitle "C" of RCRA. The role of MDC-St. Louis as a hazardous waste generator and storage facility is addressed. Appropriate available film(s) on hazardous waste are also shown.

1.2 Definition of Hazardous Wastes and Safety Precautions

This section defines hazardous wastes in terms of toxicity, reactivity, corrosivity, and ignitability. Included is a general overview of the types of hazardous wastes generated at the facility, along with their characteristics and dangerous properties. More specific identification and descriptions appear in Section 2 of this Manual.

The company policy on use of protective clothing and safety equipment is explained in this section.

Section 2 - Facility and Process Description

2.1 Description of Wastes to be Managed

This section describes the hazardous wastes generaged from the company's process tank lines, paint shops, ramp operations, chemical laboratories, and other generating activities.

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2.2 <u>Description of Storage Facilities</u>

In this section, the various storage sites are described through the use of site plans, viewgraphs, etc. Also discussed are the intended uses for each site, their capacities and restrictions.

2.3 <u>Normal/Routine Operations</u>

Normal/routine operations, including types of containers authorized for use, protective clothing and safety equipment, and handling techniques are discussed in this section. Also discussed is the meaning of operation of various monitoring devices installed by the company.

2.4 Waste Analysis

Since the physical act of analyzing wastes is performed by either highly qualified in-house laboratories or outside firms expert in this service, the actual routines (techniques) employed in waste analysis are not covered in this Manual. What is discussed is the need for analysis, the dangers in handling unknowns, and the procedures for obtaining waste analysis.

2.5 <u>Inspections</u>

The requirement for inspections and their frequencies are discussed, along with inspection details and MDC-St. Louis forms to be used.

2.6 Security

The individual's role in maintaining security of the facilities is explained, in addition to the roles of the MDC-St. Louis Security Guard Services and Fire Services.

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2.7 Record-Keeping and Reporting Requirements

This section includes the RCRA requirements for types of records, retention times, and reporting requirements.

Section 3 - Emergency Procedures and Contingency Plans

This section discusses the MDC-St. Louis Contingency Plan, Spill Prevention Control and Countermeasures Plan (SPCC), Company Control Procedures relating to emergencies, and Company Standard Maintenance Procedures as they apply to hazardous waste handling.

Based on these definitions,

Environmental Emergency - A situation which poses a direct hazard to human life, health, property, and equipment.

Fire and/or explosion are examples of an environmental emergency. Also, a spill or material release which results in the release of flammable liquids, vapors, or toxic liquids or fumes.

Pollution Upset

- Accidental spills/leaks, unavoidable upsets, equipment breakdowns, or any other malfunctions that <u>do not</u> pose a direct threat to human life, health, property, and equipment, but <u>do pose a threat to the environment.</u> Oil spills/leaks or other material loss which may result in environmental pollution.

Facility personnel who handle hazardous waste are trained in the proper procedure for responding to emergencies. This training includes spoken words in conjunction with a visual presentation and handouts. These personnel are instructed that in the event of an Environmental Emergency,

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2.7 (Continued)

the MDC-St. Louis Fire Services and Security Services will be notified immediately. The initial response to such an emergency will be to protect human health and safety, property and equipment, and then the environment.

The emergency equipment associated with combating fire or explosion is operated by MDC-St. Louis Fire Services personnel. These personnel are included in our training category of "Technical Personnel" and will have received "comprehensive" training.

This manual is used for classroom training in a tiered manner to provide comprehensive training for some personnel, and more limited training for others. Figure H-3 depicts the depth of training for various job classifications.

H-1c TRAINING PROGRAM PERSONNEL

This Training Program is conducted by members of the MDC-St. Louis Training Department (a highly qualified educational organization) under the technical direction of the Environmental Pollution Control Section of the Plant Engineering Department. The Environmental Pollution Control Section is staffed with a Chemistry major, a Biology/Chemistry major, a Geology/Biology major, and other engineering and technical personnel. In addition, mechanical, electrical, civil/structural, and architectural engineering support is provided by the other branches of the Plant Design and Maintenance Engineering Department, which is currently staffed with approximately 75 engineers and technical personnel. (Copies of the job or position descriptions and the educational and experience backgrounds of the above personnel are on file in the company Personnel Division, and may be reviewed by EPA officials and Missouri DNR upon request.)

CONTINGENCY PLAN								
EMERCE	U	U	U	U	U	U		
RECORD KEES	U	U	U	Ç	Ĺ	L		
FACILITY SECURITY	U	U	U	С	U	L	۲	
FACILITY		٦	U	C	C		J	7
OPERATIONS SNOITARAGO SISYJANA	7		U	C	L		٦	
NORM		Ţ	L	J.	С	C	C	S
PACILITY DESCRIPTION	U	C	C	C	C	S	٦	
NASTE DESCRIPTIONS	ļ		Γ	C	U	C	C	U
NASTE DESCRIPTION AND SAFETY WASTE	L		J	J	ن	U	C	U
PEGULATIONS WASTE	U	2	J	U			ل	
	BRANCH MANAGERS	SUPERINTENDANTS	SECTION MANAGERS	TECH. PERSONNEL	FOREMEN	ASSISTANT FOREMEN	MAINT. PERSONNEL	MATERIAL HAND PERSONNEL

C = COMPREHENSIVE

L = LIMITED

DEPTH OF TRAINING

FIGURE H-3

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H-1d RELEVANCE OF TRAINING TO JOB POSITION

As cited in Section 3 and Figure H-3, this program is tiered to provide relevant training at various levels within the company. For example, the Maintenance and Material Handling personnel receive training with emphasis on waste handling and personal/environmental safety, while record-keeping, reporting, RCRA regulations, etc. are emphasized in the higher levels that are not directly involved in waste handling.

H-le TRAINING FOR EMERGENCY RESPONSE

The Training Program utilizes the company Emergency and Contingency Plans as the basis for emergency response. The company has its own Fire Services, consisting of at least eight (8) firemen and one (1) officer on duty at all times. These firemen are trained to handle fires, explosions, and other emergencies. In addition, the company has its own Security Guard Services of more than two hundred and twenty-five (225) personnel. All evacuation, crowd control, etc. is the function of this organization.

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H-2 IMPLEMENTATION OF TRAINING PROGRAM

The staff of the Plant Environmental Control Section and current hazardous waste handling and Maintenance personnel have been trained, as of this date of this submittal. All future new personnel will complete this Training Program within six months of their assignment to the hazardous waste handling activity, or within six months of their date of employment, whichever is later. No employe who has not been trained will work unsupervised prior to completion of the program.

Additionally, the annual review has been conducted for those personnel working in the program for more than one year.

Records documenting the job title, job description, employe name, and training received are on file in the Personnel Division of the company.

These records will be maintained until closure of the facility. Training records on former employes will be kept for three years after termination.

SECTION I

CLOSURE PLAN, POST-CLOSURE PLAN, FINANCIAL REQUIREMENTS

This section is submitted in accordance with the requirements of 40 CFR 122.25(a)(13), 264.112 through 264.115, 264.178, 264.197, and 264.258. This plan identifies all steps that will be necessary to partially close the facility at any point during its intended operating life and to completely close the facility at the end of its intended operating life. The plan also addresses the conditions and reasons under which partial closure will occur. A post-closure plan is not required because this is not a disposal facility, and all wastes are being removed at closure.

McDonnell Douglas Corporation-St. Louis (MDC-St. Louis) will maintain an onsite copy of the approved closure plan and all revisions to the plan until the certification of closure completeness has been submitted and accepted by EPA, Region VII. MDC-St. Louis will notify the Regional Administrator at least 180 days prior to the date we expect to begin final closure. The closure date for closure of the entire facility will probably be sometime after 2002. Upon completion of closure, MDC-St. Louis will submit to the Regional Administrator a certification by both MDC-St. Louis and by a professional engineer (registered in the State of Missouri) that the facility has been closed in accordance with the specifications in the approved closure plan.

- I-1 Closure Plan (40 CFR 122.25(a)(13))
- I-la Closure Performance Standard (40 CFR 264.111), (10 CSR 25-7.011(9)(A)2.)

 This closure plan was designed to ensure that the facility will not require further maintenance and controls, minimizes or eliminates threats to human health and the environment, and avoids escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground or surface waters or to the atmosphere. If there is evidence of any spills or leaks, samples will be taken and analyzed to determine the extent of contamination in the soil, and if necessary, in the groundwater. Any contaminated soil will be excavated, removed, and disposed of at a proper disposal facility. Any contaminated groundwater will be remedied. The following sections discuss in detail efforts to be made at MDC-St. Louis to satisfy the closure performance standard.
- I-1b Partial and Final Closure Activities

All the storage facilities are temporarily thru-put storage for waste generated at MDC-St. Louis facilities pending off-site final disposal. None are permanent storage or disposal facilities. All are directly related to production schedules and while it is difficult to project their exact life, 20 years is the projected life. However, it is anticipated that some of the underground storage tanks will have to be replaced in the next 20 years, and the steps outlined in this plan will apply to disposal of the old tanks prior to installing new ones.

I-lc Maximum Waste Inventory

- Drum storage facility at Bldg. 27 scrap dock 360 full drums and
 396 empty drums
- 2. Spent caustic tanks east of Bldg. 52 20,000 gallons
- 3. Titanium etch storage tanks at Bldg. 52 4,500 gallons

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R

- 4. Steel chem-mill storage tanks at Bldg. 52 2,500 gallons
- 5. Underground waste jet fuel tank, Bldg. 28 5,000 gallons
- 6. Underground waste jet fuel tank at Fuel Pit #3 2,000 gallons
- 7. Underground waste jet fuel tank behind Hush House 3,380 gallons
- 8. Underground waste jet fuel tank by F-18 Silencer 2,000 gallons
- 9. Underground waste oil tank east of Bldg. 6 1,000 gallons
- 10. Sludge holding tank at Bldg. 14 120,000 gallons
- 11. The explosives storage facility, Bldg. 10 100 pounds
- 12. Underground waste jet fuel tank at Fuel Pit #4 2,000 gallons R
- 13. Underground waste jet fuel tank at Ramp Station 1 and 2 4,380 gallons R
- I-ld Inventory Removal and Disposal or Decontamination of Equipment
 - 1. Drum storage facility west of Bldg. 39: Remove all remaining drums and ship to EPA-approved disposal facilities four weeks. Remove corrosion from metal and empty and decontaminate sump two weeks. Analyze asphalt overlay to determine if it is contaminated with hazardous waste one week. Remove asphalt (if hazardous) and dispose of it at an EPA-approved disposal facility four weeks. Fill sumps with sand and seal with concrete one week. Either convert the building to other use or demolish it and salvage the metal as scrap iron.

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I-ld (Continued)

- 2. Spent caustic tanks east of Bldg. 52: Remove all liquid and sludge and dispose of it at an EPA-approved disposal facility four weeks. Hose down the inside of the tanks to remove any residue one week. Disconnect the piping and pump and thoroughly decontaminate them one week. Remove the tanks two weeks. Remove any residue from the asphalt one week. Analyze samples from asphalt and soil under tanks to determine if it is hazardous one week. If hazardous, remove asphalt and soil to an EPA-approved disposal facility.
- 3. Titanium etch storage tanks and steel chem-mill storage tanks at Bldg. 52: Remove all liquid and sludge and dispose of it at an EPA-approved disposal facility - one week. Remove tanks, platform, and piping. Analyze samples from limestone under tanks to determine if it is hazardous - one week. If hazardous, dispose of it at an EPA-approved disposal facility.
- 4. Underground oil and jet fuel tanks, Bldgs. 6 and 28, Fuel Pit #3, behind Hush House, F-18 Silencer, Fuel Pit #4, and Ramp Station 1 and 2: Remove all oil and jet fuel one week. Remove all sludge from the bottom of the tank and dispose of jet fuel and sludge at an EPA-approved disposal facility one week. Excavate and remove the tank two weeks. Analyze the soil around the tank to determine if it is hazardous one week. Remove contaminated soil, if required, and dispose of it at an EPA-approved disposal facility four weeks. Fill the hole or install a new tank two weeks.

5. Sludge holding tank at Bldg. 14: Remove all sludge and dispose of it at an EPA approved disposal facility - four weeks. Hose down walls and floor of concrete tank thoroughly. Flush the centrifuge, all pumps and related piping - one week.

6. The explosives storage facility, Bldg. 10: Remove all explosive devices and material. Sweep down the walls, shelves, ledges, floor, etc. to remove any hazardous residue. Dispose of all waste and residue at an EPA approved disposal facility - five weeks. Either convert the building to other use or demolish the building and dispose of the rubble in a landfill - three weeks.

I-le Schedule for Closure

Within 90 days after receipt of the final volume of hazardous wastes, final closure activities will be initiated. Completion of closure will be within 180 days of this occurrence. All financial calculations are based on a closure data in the year 2002. The Regional Administrator will be notified by MDC-St. Louis 180 days before beginning final closure. Final closure will be supervised and certified by a professional engineer, in addition to the owner or operator.

I-lf Extensions for Closure Time (40 CFR 264.113(a) and 264.113(b))
MDC-St. Louis will probably not require an extension for closure time.

(I)

I-2 Post-Closure Plans (40 CFR 122.25(a)(13), 10 CSR 25-7.011(9)(E)

Post-closure care will not be needed for this facility because this is not a disposal facility.

I-3 Notice in Deed and Notice to Local Land Authority (40 CFR 122.25(a)(14), 10 CSR 25-7.011(9)(F)3.

Because MDC-St. Louis is only a hazardous waste storage facility and not a disposal facility, notation is not necessary in the deed informing potential purchasers of restrictions associated with a disposal site, as required by 40 CFR 264.120.

I-4 Closure Cost Estimate (40 CFR 122.25(a)(15) and 264.142)

The closure cost information presented is submitted in accordance with the requirements of 40 CFR 122.25(a)(15), 264.142, and 264.143.

An estimated \$235,000.00 (October 1982 cost estimate) will be needed to close the MDC-St. Louis hazardous waste storage facilities. The closure costs are presented by activity in Table I-1. Activities include removal of waste inventory, decontamination, disposal of waste solvents, disposal of contaminated soil, and closure certification.

TABLE I-1 CLOSURE COST ESTIMATES

- DRUM STORAGE FACILITY WEST OF BLDG. 39 (2 SHELTERS)
 - 1. Dispose of all containers of hazardous waste at an EPA-approved disposal facility.
 - 2. Remove any corrosion from metal shelter surfaces, deposit in drums, dispose of at an EPA-approved disposal facility.
 - Remove asphalt floor overlay and curb. Deposit in drums and dispose of at an EPA-approved disposal facility.
 - 4. Fill sumps with sand, seal with concrete.
 - Dismantle shelters.

Total Estimated Cost: \$64,800.00

- B. SPENT CAUSTIC STORAGE TANKS EAST OF BLDG. 52 (2 TANKS)
 - 1. Remove all liquid and sludge from tanks, dispose of at an EPA-approved disposal facility.
 - 2. Decontaminate inside and outside of tanks.
 - 3. Disconnect pumps, piping, valves, and fittings - decontaminate.
 - Dispose of decontamination fluids and equipment at an EPA-approved disposal facility.
 - 5. Remove tanks.
 - 6. Analyze asphalt and soil for contamination.
 - 7. Remove contaminated asphalt and soil. Dispose of at an EPA-approved disposal facility.

Total Estimated Cost: \$29,600.00

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Table I-1 (Continued)

- C. WASTE ACID STORAGE TANKS, BLDG. 52 (11 TANKS)
 - Remove all liquid and sludge from tanks. Dispose of at an EPA-approved disposal facility.
 - 2. Decontaminate tanks and piping. Dispose of decontamination fluids at an EPA-approved disposal facility.
 - 3. Remove tanks, piping, and platforms.
 - 4. Analyze limestone and soil surrounding and under tanks; if contaminated, remove and dispose of at an EPA-approved hazardous waste landfill.

Total Estimated Cost: \$25,300.00

- D. UNDERGROUND WASTE OIL AND JET FUEL STORAGE TANKS (7 TANKS)
 - 1. Remove all waste oil or jet fuel.
 - 2. Remove all sludge and residue from tanks.
 - 3. Dispose of waste oil, jet fuel, sludge, and residue at an EPA-approved disposal facility.
 - 4. Evacuate and remove tanks.
 - 5. Analyze surrounding soil; if contaminated, remove and dispose of at an EPA approved hazardous waste landfill.
 - 6. Fill in holes with fresh soil or limestone screening.

Total Estimated Cost: \$104,500.00

- E. SLUDGE HOLDING TANK, BLDG. 14
 - 1. Remove all sludge; dispose of at an EPA-approved facility.
 - 2. Wash down walls and floor of concrete tank.
 - 3. Flush all piping, pumps, and centrifuges.

Total Estimated Cost: \$30,800.00

DATE: 20 FEB 84 REVISION NO.: 2 (I)

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Table I-1 (Continued)

- F. EXPLOSIVES WASTE STORAGE FACILITY, BLDG. 10
 - 1. Remove all explosive devices and material.
 - 2. Sweep down walls, shelves, ledges, floors, etc. Remove hazardous residue.
 - 3. Dispose of explosive devices, material, and residue at an EPA approved TSD facility.
 - 4. Demolish building and dispose of rubble at local landfill.

Total Estimated Cost: \$33,000.00

NOTE: All cost estimates assume the use of outside contract services and include 10% contingencies.

This closure cost estimate will be kept on file at the MDC-St. Louis Facility. It will be revised whenever a change in the closure plan affects the cost of closure. It will be adjusted annually (from the date of its original development) to reflect changes in closure cost brought about by inflation. The Department of Commerce's Annual Implicit Price Deflator for Gross National Product will be used to make this adjustment.

- I-5 <u>Financial Assurance Mechanism for Closure [40 CFR Sections 122.25(a)(1), 264.143, 264.150, 10 CSR 25-7.011(8)]</u>
- I-5a Closure Trust Fund [40 CFR Sections 264.143(a) and 264.151(a)(1)]
 MDC-St. Louis has established a financial test as the selected financial assurance mechanism, and therefore a Closure Trust Fund is not required.
- I-5b Surety Bond [40 CFR Sections 264.143(c)(1) and 264.151(a)(1)]

 MDC-St. Louis has established a financial test as the selected financial assurance mechanism, and therefore a Surety Bond Fund is not required.
- I-5c Closure Letter of Credit [40 CFR Sections 264.143(d)(1) and 264.151(a)(1)] MDC-St. Louis has established a financial test as the selected financial assurance mechanism, and therefore a Closure Letter of Credit is not required.
- I-5d Closure Insurance [40 CFR Sections 264.143(e)(1) and 264.151(a)(1)]

 MDC-St. Louis has established a financial test as the selected financial assurance mechanism, and therefore Closure Insurance is not required.

- I-5e Financial Test (40 CFR Sections 264.143(f)(1) and 264.151(a)(1))

 MDC-St. Louis has established a Financial Test as the selected financial assurance mechanism. An originally signed duplicate of the financial test has been sent to the Regional Administrator by certified mail. A copy of the agreement is attached as Attachment I-1.
- I-5f Combinations (40 CFR Sections 264.143(g) and 264.151(a)(1))

 MDC-St. Louis has established a Financial Test as the sole selected financial assurance mechanism and will not use a combination of financial mechanisms.
- Post-Closure Cost Estimate (40 CFR Sections 122.25(a)(16) and 264.144)

 Since all wastes will be disposed of off-site, there will be no postclosure activities or costs.
- I-7 Financial Assurance Mechanism for Post-Closure (40 CFR Sections 122.25(a)(16) and 264.154)

 Since all wastes will be disposed of off-site, there will be no post-closure activities or costs.
- I-8 Liability Insurance (40 CFR Sections 122.25(a)(17) and 264.147)
- I-8a Sudden Insurance (40 CFR Sections 264.147(a), 264.151(i), and 264.151(j)) MDC-St. Louis has obtained liability insurance for sudden and accidental occurrences in the amount of \$2 million per occurrence with an annual aggregate of \$2 million exclusive of legal defense costs. An originally signed certificate of liability insurance has been sent to the Regional Administrator by certified mail. The certificate is worded as specified in 40 CFR 264.151(g). A copy of the certificate is attached as Attachment I-2.

- I-8b Nonsudden Insurance (40 CFR 264.147(b), 264.151(i), and 264.151(j)

 MDC-St. Louis is a storage facility; therefore, no liability insurance is required for a nonsudden accidental occurrence.
- I-8c Financial Test (40 CFR 264.147(f) and 264.151(j)

 MDC-St. Louis has obtained liability insurance for sudden and accidental occurrences, therefore, the financial test is not required.
- I-8d Variance Procedures (40 CFR Section 264.147(c)
 MDC-St. Louis will not request the Regional Administrator for a reduction of liability amounts.
- I-8e Adjustment Procedures (40 CFR Section 264.147(c)

 If the Regional Administrator increases the amounts of liability coverage, or elects to improve nonsudden liability coverage requirements, MDC-St. Louis will immediately seek an adjustment to the insurance policy discussed here.
- I-9 <u>State Assumption of Responsbility (40 CFR 264.150)</u>
 MDC-St. Louis will not request state assumption of the legal or financial responsibilities.

ÀTTACHMENT I-1

6 July 1982

Regional Administrator
U.S. Environmental Protection Agency
Region VI
1203 Elm Street
First International Building
Dallas, Texas 75270

Regional Administrator U.S. Environmental Protection Agency Region VII 324 East Eleventh Street Kansas City, Missouri 64106

Dear Sirs:

I am the chief financial officer of McDonnell Douglas Corporation, P.O. Box 516, St. Louis, Missouri 63166. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post-closure care as specified in Subpart H of 40 CFR Parts 264 and 265.

The owner or operator identified above is the owner or operator or the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265:

McDonnell Douglas Corporation EPA ID No. MODO0818963 P.O. Box 516 CO St. Louis, Missouri 63166

McDonnell Douglas Corporation EPA ID No. OKDO41501347 2000 North Memorial Drive Tulsa, Oklahoma Page Two 6 July 1982

The owner or operator identified above owns or operates the following facilities for which financial assurance for closure or post-closure care is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post-closure cost estimates covered by the test are shown for each facility:

St. Louis Facility
\$ 235,000.
Tulsa Facility
\$ 3,300,000.

The owner or operator identified above guarantees, through the corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure and post-closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility:

None

In States where EPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 and 265, this owner or operator is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post-closure cost estimates covered by such a test or shown for each facility:

None

The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for the closure or, if a disposal facility, post-closure care, is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post closure cost estimates not covered by such financial assurance or shown for each facility:

None

This owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this owner or operator ends on December 31. The figures for the following items marked with an asterisk or derived from this owner's or operator's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 1981.

Part B. Closure or Post-Closure Care and Liability Coverage

Alternative I

1.	Sum of current closure and post-closure cost estimates (total of all cost estimates listed above)	\$	3,535,000.
2.	Amount of annual aggregate liability coverage to be demonstrated	\$	2,000,000.
3.	Sum of lines 1 and 2	\$	5,535,000.
* 4.	Total liabilities (if any portion of your closure or post-closure cost estimates is included in your total liabilities, you may deduct that portion from this line and add that amount to lines 5 and 6)	\$2,7	10,700,000.
* 5.	Tangible net worth	\$1,6	13,100,000.
* 6.	Net worth .	\$1,6	53,500,000.
* 7.	Current assets	\$3,0	14,200,000.
* 8.	Current liabilities	\$2,6	39,400,000.
9.	Net working capital (line 7 minus line 8)	\$ 3	74,800,000.
* 10.	The sum of net earnings plus depreciation and amortization	\$ 3	25,000,000.
* 11.	Total assets in U.S. (required only if less than 90% of assets are located in the U.S.)	\$	N/A
	· ·	Yes	No
12.	Is line 5 at least \$10 million?	X	
13.	Is line 5 at least 6 times line 3?	X	
14.	Is line 9 at least 6 times line 3?	X	

Page Four 6 July 1982

		Yes	No
* 15.	Are at least 90% of assets located in the U.S.? If not, complete line 16	X	
16.	Is line 11 at least 6 times line 3?	N/	'A
17.	Is line 4 divided by line 6 less than 2.0?	X	
18.	Is line 10 divided by line 4 greater than 0.1?	X	
19.	Is line 7 divided by line 8 greater than 1.5?		χ

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 264.151 (g) as such regulations were constituted on the data shown immediately below.

J. G. Brown Vice President-Tresurer 6 July 1982

Ernst & Whinney

10 Broadway St. Louis, Missouri 63102

314/231-7700

McDonnell Douglas Corporation St. Louis, Missouri

We have applied certain procedures, as discussed below, with respect to selected data contained in J. G. Brown's letter dated 6 July 1982 to the Regional Administrators of Regions VI and VII of the U.S. Environmental Protection Agency. These procedures were performed solely for inclusion with this letter referred to above, and our report is not to be used for any other purpose. The procedures we performed are summarized as follows:

- a. We determined that the amounts included in the letter referred to above for Total Liabilities, Tangible Net Worth (Total Assets less Deferred Charges and Total Liabilities), Net Worth, Current Assets, Current Liabilities, Net Working Capital (Current Assets less Current Liabilities) and Net Earnings plus Depreciation and Amortization were in agreement with or derived from the 31 December 1981 Audited Consolidated Financial Statements of McDonnell Douglas Corporation.
- b. We determined that the assets located in the United States which were included in the Consolidated Balance Sheet of McDonnell Douglas Corporation as of 31 December 1981 exceeded 90% of total assets at that date.

Because the above procedures do not constitute an examination in accordance with generally accepted auditing standards, we do not express an opinion on any of the accounts or items referred to above. No matters came to our attention that caused us to believe that the specified data should be adjusted. This report relates only to the accounts and items specified above and does not extend to any financial statements of McDonnell Douglas Corporation taken as a whole.

Ernst & Whinney

St. Louis, Missouri 6 July 1982

Ernst & Whinney

10 Broadway St. Louis, Missouri 63102

314/231-7700

Shareholders and Board of Directors McDonnell Douglas Corporation St. Louis, Missouri

We have examined the consolidated balance sheet of McDonnell Douglas Corporation and consolidated subsidiaries as of 31 December 1981 and 1980, and the related consolidated statements of earnings, shareholders' equity and changes in financial position for each of the three years in the period ended 31 December 1981. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the consolidated financial position of McDonnell Douglas Corporation and consolidated subsidiaries at 31 December 1981 and 1980, and the consolidated results of their operations and the changes in their financial position for each of the three years in the period ended 31 December 1981, in conformity with generally accepted accounting principles applied on a consistent basis.

St. Louis, Missouri 28 January 1982 Ernst + Whinney

Alexander & Alexander Inc. R. B. Jones of St. Louis, Inc. 120 South Central Avenue St. Louis, Missouri 63105

ATTACHMENT I-2



CERTIFICATE OF INSURANCE

No. 46

Date 03 August 1982

CERTIFICATE ISSUED TO

NAMED INSURED AND ADDRESS

United States Environmental Protection Agency Region VII 324 East Eleventh Street Kansas City, Missouri 64106

MC DONNELL DOUGLAS CORPORATION AND ANY OF ITS DIVISIONS OR SUBSIDIARY COMPANIES POST OFFICE BOX 516 ST. LOUIS, MISSOURI 63166

This is to certify that the Central National Insurance Company of Omaha has issued to the Named Insured, insurance affording coverage as indicated below. THIS CERTIFICATE OF INSURANCE NEITHER AFFIRMATIVELY NOR NEGATIVELY AMENDS, EXTENDS OR ALTERS THIS COVERAGE AFFORDED BY ANY POLICY DESCRIBED HEREIN.

KIND OF Insurance	POLICY	COMPANY	POLICY	LIMITS OF LIABILITY
Comprehensive Generaliability-Products pleted Operation (Excluding Aircraft Products), Contractual Liability, Comprehensive Automobile Liability.	CNS 13- 30-35	Central National Ins. Co. of Omaha	8/1/82 to 8/1/85	\$2,000,000. Each Occurrence Single Limit Bodily Injury and Property Damage \$2,000,000. Annual Aggregate

SEE ATTACHED ADDENDUM

In the event of any material change in, or cancellation of, said policies, the company(s) will give 30 Days written notice to the party to whom this certificate is issued, but failure to give such notice shall impose no obligation nor liability upon the company.

William A. Lawrence, Jr., Vice President

ADDENDUM #1 TO CERTIFICATE OF INSURANCE #46 DATED 8/3/82

- 1. The Central National Insurance Company, the Insuror, of 3580 Wilshire Boulevard, Los Angeles, California 90010, hereby certifies that it has issued liability insurance covering bodily injury and property damage to McDonnell Douglas Corporation, the Insured, of P. O. Box 516, St. Louis, Missouri 63166, in connection with the Insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies at the Tulsa Facility, EPA I.D. No. OKD041501347, 2000 North Memorial Drive, Tulsa, Oklahoma, and at the St. Louis Facilities, EPA I.D. No. MOD000818963, Tracts I and II, Brown, Lindbergh and Banshee Roads, St. Louis, Missouri 63166, for sudden and accidental occurrences. The limits of liability are \$2,000,000.00 each occurrence and \$2,000,000.00 annual aggregate, exclusive of legal defense costs. The coverage is provided under policy No. CNS 13-30-35 issued on August 1, 1982. The effective date of said policy is August 1, 1982.
- 2. The Insuror further certifies the following with respect to the insurance described in Paragraph 1:
 - a) Bankruptcy or insolvency of the insured shall not relieve the insuror of its obligations under the policy.
 - b) The Insuror is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the Insured for any such payment made by the Insuror. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147 or 265.147.
 - c) Whenever requested by a Regional Administrator of the U.S. Environmental Protection Agency (EPA), the Insuror agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.
 - d) Cancellation of the insurance, whether by the Insuror or the Insured, will be effective only upon written notice and only after expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facilities are located.
 - e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facilities are located.

ADDENDUM #1 TO
CERTIFICATE OF INSURANCE
#46
DATED 8/3/82

I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insuror is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insuror, in one or more States.

Signed by:/

William A. Lawrence, Jr.

Vice President

Alexander & Alexander, Inc. Authorized Representative of Central National Insurance Co. 120 South Central Avenue Saint Louis, Missouri 63105

DATE: 6 OCT 1982 REVISION NO.: 0 (J)

SECTION J

OTHER FEDERAL LAWS

Information will be provided in accordance with the requirements of 40 CFR Part 122.12, Part 122.25(a)(20) and MO CSR 25-7.011(2)(C)2 at the request of the EPA Region VII office and/or Missouri Department of Natural Resources. At this time, however, we believe this facility is in compliance with the following Federal laws; Wild and Scenic Rivers Act, National Historic Preservation Act of 1966, Endangered Species Act, Coastal Zone Management Act, and the Fish and Wildlife Coordination Act.

DATE: 6 OCT 1982 REVISION NO.: 0 (K)

SECTION K

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Date:	10-1-82	Signature: Saul ()
		Harold D. Altic

Executive Vice President McDonnell Aircraft Company

Engineer's Certification

This is to certify that this application has been prepared to comply with the regulations of the Resource Conservation and Recovery Act and all applicable standards, rules, and regulations for hazardous waste storage facilities. It is my understanding that this facility has been designed to provide adequate protection of the health of humans and other living organisms.

Registered Professional Engineer Submitting Plans

Name:	Earl	Μ.	Myers	(Director)	
Disassa	/ 27	۸١.	004 705	••	

Phone: (314) 234-7058

Name of Consulting Firm: Plant Engineering Department

(McDonnell Aircraft Company)

Address: P.O. Box 516, St. Louis, Missouri 63166

Signature	≘:	· ver	1	J.	Megers	_
Registrat	tion	Number:	E	8041	1	
Date:	2	MINIE 84				

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